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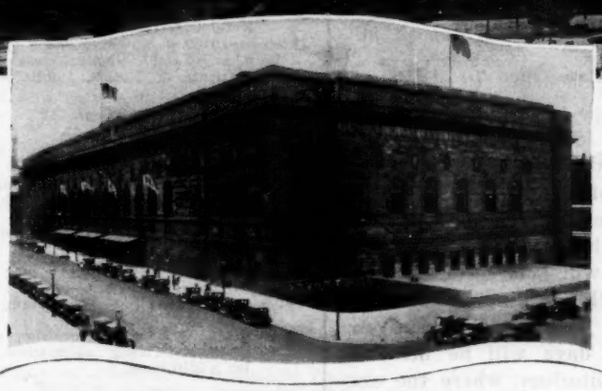
Cleveland, O.
August 29, 1929

Congress and Show To Reflect Importance of Metals

Steel Treating, Welding and Metal Working Organizations Will Conduct Meetings in Cleveland

Public square, Cleveland, showing the new Terminal Tower building, and below, Public Auditorium



WHILE the fabrication of metals has developed into an exact science, it is necessary only to retrace civilization a comparatively few years to find our ancestors employing crude methods. During the Revolutionary period few manufacturing processes were available. Cannon and cannon balls were cast from iron—other weapons, certain farm implements and tools were fashioned in the hand forge. Nearly 125 years elapsed before the bessemer and open-hearth processes for making steel were sufficiently well established to justify the statement that the world was ushering in an "age of steel."

But with the basic methods for steel-making firmly entrenched with the beginning of the twentieth century, developments and refinements followed in rapid sequence. Taylor and White introduced the first new high-speed steel in 1900, thereby revolutionizing metal-cutting operations. Next came the perfection of alloy steels, which exerted a tremendous influence in the design and manufacture of of steel products. The growing American automobile industry placed new demands upon engineering materials and on the heels of this the World war created a need for special materials

which could be produced quickly in large quantities and possessed of superior qualities. With the war ended, peacetime demands for steel increased by leaps and bounds, forcing industry to extend itself in supplying the new needs.

Throughout the latter period of almost 30 years, chemists, metallurgists and experts in metal have been called

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upon to solve many problems in the development of new materials, improved methods of treatment and fabrication, and more rapid means of production. The fact that the engineer has at his disposal today a choice of hundreds of steels and alloys and innumerable processes for the conversion of these materials into finished products stands as a glowing tribute to those technicians.

Interests Are Interlinked

That the march of progress can go on, those interested in the manufacture of iron, steel and nonferrous alloys have bound themselves together in various technical groups for the purpose of studying their problems and exchanging information. So closely interlinked are the interests of these organizations that for the last two years three of the largest societies conducted simultaneous conventions and thereby created National Metal Week. So successful were these efforts that this year five technical groups will convene in Cleveland, Sept. 9-13 in what will be known as the National Metal congress.

* * *

IN 1920 the American Society for Steel Treating was organized by the amalgamation of two smaller societies, the purpose of the body being "to promote the arts and sciences connected with either the manufacture or treatment of metals, or both." Enjoying a continuous and a healthy growth, this society quickly reached front rank in American technical societies. Each year in connection with its annual convention the organization has conducted an exposition featuring the manufacture, treatment and fabrication of metals. Success also has been attendant upon these expositions, thus it is but natural that other groups interested in metals should find it advantageous to conduct their meetings concurrently.

Joining with the American Society for Steel Treating in the National Metal congress in Cleveland are the American Welding society and the Institute of Metals and Iron and Steel divisions of the American Institute of Mining and Metallurgical Engineers and the Iron and Steel division of the American Society of Mechanical Engineers. The Welding society and Institute of Metals have convened with the Steel Treaters in the two preceding years, while the two iron and steel divisions are taking part for the first time. In addition to participation in the congress, the American Welding society will sponsor a welding and cutting exposition as one section of the National Metal exposition.

Sessions Are Open to All

All five groups have arranged complete programs for their meetings and are throwing their sessions open to the members of other societies. The American Society for Steel Treating will have its headquarters at Hotel Cleveland and will hold technical sessions there each morning from Monday to Friday. Afternoon sessions on each of these days will be held in the Public Auditorium, where the exposition will be under way. The annual business meeting of the society will be on Wednesday morning and will be followed by the Campbell Memorial lecture, delivered this year by Dr. Albert Sauveur, Harvard university, Cambridge, Mass.

Eighteen plant visitations to 24 Cleveland establishments have been arranged for various days in the week and members of all five societies are invited to take advantage of them. Details of the trips are listed on Page 513 of this issue. Steel Treater entertainment features will include a ball in Hotel Cleveland on Tuesday evening and a banquet at the same place on Thursday evening. One of the features of the banquet will be the award of the Henry Marion Howe gold medal to the author of the best paper published in *Transactions* during the past year.

Research Division Meeting

The American Welding society will make its headquarters at Hotel Statler, holding sessions there on Tuesday, Thursday and Friday mornings. Sessions on Tuesday, Wednesday and Thursday afternoon will be at Public Auditorium. The American Bureau of Welding, the research division of the society, will meet at Hotel Statler, Friday afternoon. Social features will include the Steel Treater ball on Tuesday evening and the annual banquet and dance on Thursday evening at Hotel Statler.

Headquarters of the Institute of Metals will be at Hotel Cleveland, with the meeting commencing Tuesday and ending on Thursday. Technical sessions will be held at the hotel on Tuesday and Thursday mornings. A session at Public audi-

Condensed Program of A.S.S.T.

Monday, Sept. 9

10:00 a. m.—Technical session, Hotel Cleveland.
12:00 m.—Registration, Public Auditorium.
12:00 m.-10:00 p. m.—Exposition open.
2:00 p. m.—Technical session, Public Auditorium.

Tuesday, Sept. 10

9:15 a. m.—Plant visitation.
10:00 a. m.—Technical session, Hotel Cleveland.
12:00 m.-6:00 p. m.—Exposition open.
2:00 p. m.—Plant visitation.
2:00 p. m.—Technical session, Public Auditorium.
9:30 p. m.—Grand ball, Hotel Cleveland.

Wednesday, Sept. 11

9:15 a. m.—Plant visitation.
9:30 a. m.—Annual business meeting, Hotel Cleveland.
10:30 a. m.—Campbell Memorial lecture, Hotel Cleveland.
12:00 m.-10:00 p. m.—Exposition open.
2:00 p. m.—Joint technical session with Institute of Metals, Public Auditorium.

Thursday, Sept. 12

9:15 a. m.—Plant visitation.
10:00 a. m.—Technical session, Hotel Cleveland.
12:00 m.-6:00 p. m.—Exposition open.
2:00 p. m.—Technical session, Public Auditorium.
6.30 p. m.—Annual banquet, Hotel Cleveland.

Friday, Sept. 13

9:15 a. m.—Plant visitation.
10:00 a. m.—Nitriding symposium, Hotel Cleveland.
12:00 m.-10:00 p. m.—Exposition open.
2:00 p. m.—Nitriding symposium, Public Auditorium.

torium on Wednesday afternoon will be conducted jointly with the American Society for Steel Treating. A special inspection trip to the Nela Park works of the General Electric Co. will be made on Thursday afternoon. Members of the institute will participate in the Steel Treater ball on Tuesday evening and the banquet on Thursday evening; in addition it will join the Iron and Steel division of the Mining and Metallurgical Engineers in a dinner on Tuesday evening. Details of the institute's program are given on Page 510.

The Iron and Steel division of the Mining engineers, meeting for the first time during the National Metal congress, also will begin its meeting on Tuesday with headquarters at Hotel Cleveland. The opening technical session on Tuesday morning will be in Public Auditorium, the Wednesday morning session at Hotel Cleveland and the final session on Thursday afternoon at Public Auditorium. The division will join with the Institute of Metals in a dinner at Hotel Cleveland on Tuesday evening. The complete program for the division will be found on Page 512.

Beginning its sessions on Wednesday afternoon, the Iron and Steel division of the American Society of Mechanical Engineers will establish itself at Hotel Hollenden. This group also is convening during the National Metal congress for the first time. Technical sessions on Wednesday, Thursday and Friday afternoons will be held in Public Auditorium while the Friday morning session will be at Hotel Hollenden. The meeting will close with a banquet at the hotel on Friday evening. The complete program as it has been announced by this group appears on Page 511 of this issue.

Steel Treater Program of Technical Papers

Monday, Sept. 8

MORNING

10:00 a. m.—Technical session in ballroom, Hotel Cleveland. Chairman: R. M. Bird.

10:15 a. m.—"Dilatation of Steel During Quenching," by G. M. Eaton, Molybdenum Corp. of America, Pittsburgh.

10:45 a. m.—"The Economical Re-use of Solid Carburizing Materials," by H. B. Knowlton, International Harvester Co., Ft. Wayne, Ind.

11:15 a. m.—"The Selection of Case Hardening Steels for Highly Stressed Gears," by H. W. McQuaid and O. W. McMullan, Timken-Detroit Axle Co., Detroit.

AFTERNOON

2:00 p. m.—Technical session in meeting room, Public Auditorium. Chairman: Bradley Stoughton.
"Conditions Necessary for Blistering of Metal During Processing," by Dr. Anson Hayes, director of research, American Rolling Mill Co., Middletown, O.

2:25 p. m.—"Dendritic Steel," by H. G. Keshian, Chase Metal Works, Waterbury, Conn.

3:00 p. m.—"Improving of Refractory Lining of Heat Treating Furnaces for High Temperature Annealing of Steel Castings," by W. J. Merten, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

3:30 p. m.—"Overheating of Steel for Forging," by W. E. Jominy, University of Michigan.

Tuesday, Sept. 10

MORNING

9:15 a. m.—Plant inspection.

10:00 a. m.—Technical session in ballroom, Hotel Cleveland. Chairman: Radcliffe Furness.
"Production of Electric Steel for Castings," by George Batty, research director, Steel Castings Development Bureau, Philadelphia.

10:30 a. m.—"Slags Produced in Steelmaking—Their Effects on the Product and on the Process Itself," by G. A. Dornin, Gathmann Engineering Co., Baltimore.

11:00 a. m.—"Melting Practice for Three Types of Electric Steel," by H. P. Rassbach, open-hearth department, Midvale Co., Philadelphia.

11:30 a. m.—"Locomotive Forgings," by Lawford H. Fry, production superintendent, Standard Steel Works, Burnham, Pa.

AFTERNOON

2:00 p. m.—Plant inspection.

2:00 p. m.—Technical session in meeting room, Public Auditorium. Chairman: H. J. Stagg.
"Methods of Tests for Determining the Machinability of Metals in General with Results," by O. W. Boston, director of engineering shops, University of Michigan, Ann Arbor, Mich.

2:30 p. m.—"On the Distribution of Hardness Produced by Cold Working," by W. P. Sykes and A. C. Ellsworth, General Electric Co., Cleveland.

3:00 p. m.—"Inherent Hardenability Characteristics of Tool Steel," by B. F. Shepherd, Ingersoll-Rand Co., Phillipsburg, N. J.

3:45 p. m.—"Some Notes on the Behavior of Carbon Tool Steel on Quenching," by G. V. Luerssen, Carpenter Steel Co., Reading, Pa.

Wednesday, Sept. 11

MORNING

9:15 a. m.—Plant inspection.

9:30 a.m.—Annual business meeting in ballroom, Hotel Cleveland. Chairman: Dr. Zay Jeffries, president.

10:30 a. m.—Campbell Memorial Lecture. Chairman: H. M. Boylston.
"Steel at Elevated Temperatures," by Dr. Albert Sauveur, Harvard University, Cambrdige, Mass.

AFTERNOON

2:00 p. m.—Joint technical session with Institute of Metals. Meeting room, Public Auditorium. Chairman: P. D. Merica.
"Preparation of Microsections of Tungsten Carbide," by Dr. S. L. Hoyt, General Electric Co., Schenectady, N. Y.
"Radiography as a Tool in the Metal Industry," by W. L. Fink and R. S. Archer, Aluminum Co. of America, Cleveland.
"Effects of Cold Working on the Physical Properties of Metals," by R. L. Templin, Aluminum Co. of America, New Kensington, Pa.
"Determining Orientation of Crystals in Rolled Metal from X-Ray Patterns Taken by the Monochromatic Pin-Hole Method," by W. P. Davey, C. C. Nitchie and M. L. Fuller, New Jersey Zinc Co., Palmerton, Pa.
"Effect of Heat Treatment on Properties and Microstructure of Brittania Metal," by B. Egeberg and H. B. Smith, International Silver Co., Meriden, Conn.

Thursday, Sept. 12

MORNING

9:15 a. m.—Plant inspection.

10:00 a. m.—Technical session in ballroom, Hotel Cleveland. Chairman: H. W. Gillett.
"Hot Aqueous Solutions for the Quenching of Steels," by H. J. French, International Nickel Co., Bayonne, N. J., and T. E. Hamill, United States bureau of standards, Washington.

10:40 a. m.—"A Study of the Iron-Chrome-Carbon Constitutional Diagram," by Dr. V. N. Krivobok, Carnegie Institute of Technology, Pittsburgh, and M. A. Grossmann, Central Alloy Steel Corp., Canton, O.

11:20 a. m.—"Nondestructive Testing," by E. A. Sperry, Sperry Development Co. Inc., Brooklyn, N. Y.
"The Brittle Range in 18-8 Chrome-Nickel Iron," by H. H. Lester, Watertown arsenal, Watertown, Mass. (By title).

AFTERNOON

1:30 p. m.—Plant inspection.

2:00 p. m.—Technical Session in meeting room, Public Auditorium. Chairman: O. E. Harder.
"Graphitization of Prequenched White Cast Iron," by H. A. Schwartz, H. H. Johnson and C. H. Junge, National Malleable & Steel Castings Co., Cleveland.

2:25 p. m.—"Austenite and Its Decomposition," by Dr. Albert Sauveur, Harvard university, Cambridge, Mass.

3:00 p. m.—"High-Strength Cast Iron," by E. J. Lowry, consulting metallurgist, Detroit.

3:30 p. m.—"Crystal Structure of an Iron Phosphide," by James B. Friauf, bureau of metallurgical research, Carnegie Institute of Technology, Pittsburgh.

Friday, Sept. 13

MORNING

9:15 a. m.—Plant inspection.

10:00 a. m.—Technical session in ballroom, Hotel Cleveland. Chairman: G. B. Waterhouse.
"The White Layer in Gun Tubes," by H. H. Lester, Watertown arsenal, Watertown, Mass.
"Observations Upon the Iron-Nitrogen System," by Samuel Epstein, Illinois Steel Co., South Chicago, Ill.
"A Study of the Nitriding Process," by V. O. Homerberg and J. P. Walsted, Massachusetts Institute of Technology, Cambridge, Mass.
"Researches on Nitriding Steels," by Dr. O. E. Harder, J. T. Gow and L. A. Willey, University of Minnesota, Minneapolis.

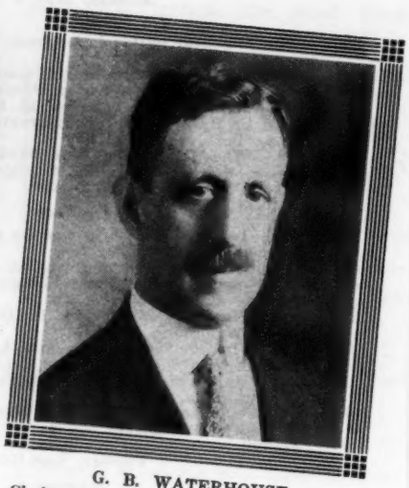
AFTERNOON

2:00 p. m.—Technical session in meeting room, Public Auditorium. Chairman: G. B. Waterhouse.
"Investigations in Nitriding," by Robert Sergeson, Central Alloy Steel Corp., Canton, O.
"Short-Time Nitriding of Steels in Molten Cyanides," by A. B. Kinzel and J. J. Egan, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.
"A Few Practical Fundamentals of the Nitriding Process," by H. W. McQuaid and W. J. Ketchum, Timken-Detroit Axle Co., Detroit.

Officials of Societies Prominent in

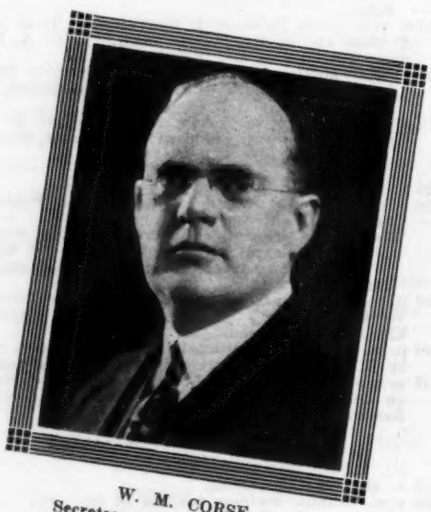
F. T. LLEWELLYN
President, American Welding Society

W. H. EISENMAN
Secretary, American Society for Steel Treating



G. B. WATERHOUSE
Chairman, Iron and Steel Division, American Institute of Mining and Metallurgical Engineers

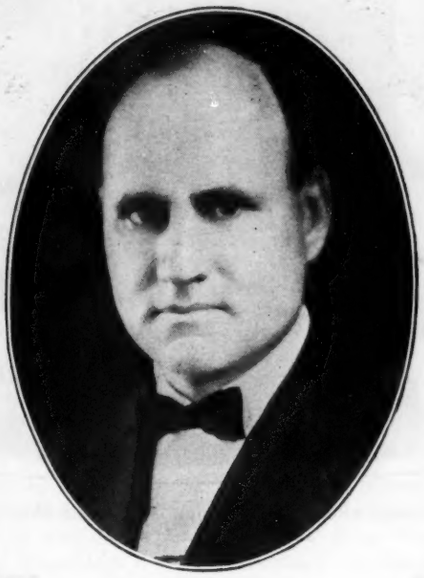
C. A. McCUNE
Treasurer, American Welding Society



W. M. CORSE
Secretary, Institute of Metals

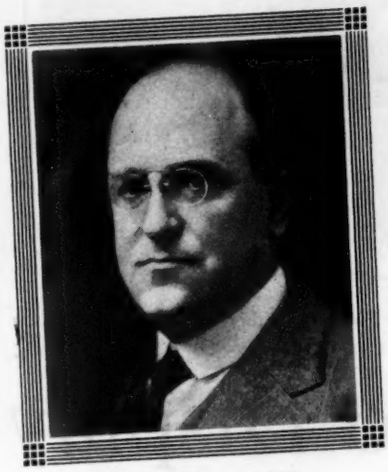
C. A. ADAMS
Director, American Bureau of Welding

Events of National Metal Congress



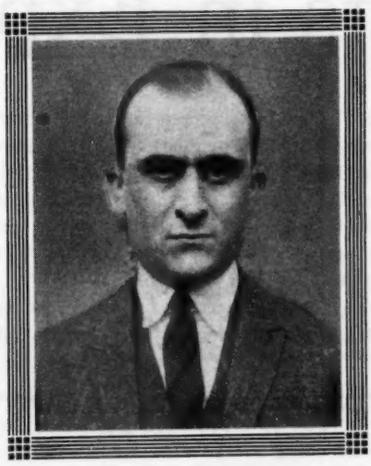
ZAY JEFFRIES
President, American Society for Steel Treating

C. SNELLING ROBINSON
Chairman, Iron and Steel Division, American Society of Mechanical Engineers



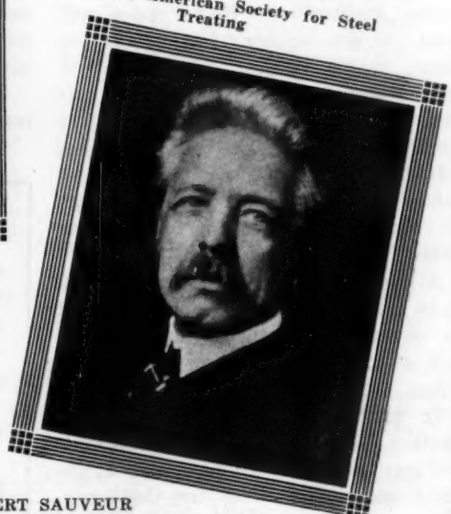
S. SKOWRONSKI
Chairman, Institute of Metals

J. M. WATSON
Treasurer, American Society for Steel Treating



WILLIAM SPRARAGEN
Technical Secretary, American Welding Society

R. G. GUTHRIE
Vice President, American Society for Steel Treating



ALBERT SAUVEUR
Campbell Memorial Lecturer, American Society for Steel Treating

The center of downtown Cleveland, showing Superior avenue at the left; Euclid avenue at the right

230 Manufacturers To Display Products in Exposition

APPROXIMATELY 230 companies will be represented with displays of equipment in the National Metal exposition in Cleveland Public Auditorium. Floor space will total 70,000 square feet, including about 10,000 square feet which will be devoted to the welding and cutting exposition sponsored by the American Welding society. In the neighborhood of 60 per cent of all exhibits will be of the operating type to show equipment performing as nearly as possible under service.

A large number of the exhibitors have announced that new products will be shown for the first time. Others will display redesigned models of existing equipment.

In addition to the welding section another large area has been set aside for gas-operated furnaces and appliances and still another for those consuming electricity. Among the many products to be shown are steels and steel products, nonferrous alloys, heat-treating furnaces, heat treating materials and cleaning compounds, welding equipment and welded products, heat control apparatus, and numerous metallurgical and physical testing devices.

The exhibits are to be placed on the main arena floor of Public Auditorium and in the Annex. Following is a list of exhibitors and the products they will display:

Exposition Hours

Monday, Sept. 9—12:00 *m. to* 10:00 *p.m.*
Tuesday, Sept. 10—12:00 *m. to* 6:00 *p.m.*
Wednesday, Sept. 11—12:00 *m. to* 10:00 *p.m.*
Thursday, Sept. 12—12:00 *m. to* 6:00 *p.m.*
Friday, Sept. 13—12:00 *m. to* 10:00 *p.m.*

A

ABRASIVE CO., Philadelphia. Booths 342, 396.—Abrasive wheels for snagging castings and in sizes, shapes, grains and grades for cylindrical, surface, tool and cutter and internal grinding and cutting-off work; also abrasive grain for drawing die molds will be exhibited by this company. In attendance will be S. M. Hershey, John F. Guthrie, W. A. McMillan, I. R. Blair, R. A. Shaffer and J. F. Fischer.

AIR REDUCTION SALES CO., New York. Booths 252, 331.—This company will display oxygen and acetylene in cylinders; oxygen discharge manifolds; welding and cutting torches, regulators and supplies; carbide; and will operate a motor-driven machine of the single pantograph type for oxyacetylene cutting shapes from a drawing or templet and a larger machine for reproduction cutting of shapes from steel plates through a motor-driven following device. Representatives will include S. P. Fetter, G. J. Dekker, H. L. Rogers, F. E. Rogers, T. M. Hamer, C. A. Daley, R. F. Helmkamp, F. J. Maeurer, and G. Van Alstyne.

AJAX ELECTROTHERMIC CORP., Trenton, N. J. Booth 399.—In operation at this booth will be a model of a 500-pound coreless induction furnace; and two small laboratory coreless induction furnaces. A polished section of an ingot made in a high-frequency furnace and photographs of furnace installations will complete the display. Dudley Willcox and Robert N. Blakeslee will represent the company.

ALLEGHENY STEEL CO., Brackenridge, Pa. Booth 70.—Will show heat and corrosion resisting metals with photographs of installations; semifinished samples of the alloys in process of fabrication. In charge will be O. M. Otte, F. S. White and Banks E. Eudy.

ALLEN, EDGAR, STEEL CO. INC., New York. Booth 284.—Will exhibit high-speed turning and finishing, air-hardening, self-hardening, chisel, knife, die casting, solid and hollow production and tool steels. Representatives will be Henry Sears Hoyt, J. King Hoyt Jr., V. A. Green, C. K. Everitt, E. R. Carnell, H. R. Adams and R. M. Brushingham.

ALLIED PRODUCTS CORP., Detroit. Booth 274.—Cold-headed products, automotive lighting equipment and replaceable and interchangeable punches and dies will be displayed. T. S. Higbee and J. E. Gladden will be in charge.

ALUMINUM CO. OF AMERICA, Pittsburgh. Booths 334, 337.—Aluminum and aluminum alloys in semifinished forms will be exhibited. Semifinished forms will include ingots; forgings; permanent mold, sand and die castings; wire; rods; bars; tubing; conduit; pipe fittings; electrical conductors; transmission cable; extruded molding and structural shapes; and rolled products. Finished forms will include welded chemical vessels, cooking utensils and furniture. F. C. Shoupe will be in charge.

AMERICAN BRASS CO., Waterbury, Conn. Booth 235.—The use of tobin bronze and copper alloy welding rods will be demonstrated. Various iron and steel pieces welded with copper alloy rods and a copper-silicon-manganese corrosion resistant alloy will complete the exhibit. W. H. Dowd, W. C. Swift, T. S. Foote, H. M. Paxon, G. E. Newton and C. G. Goodman will be in attendance.

AMERICAN CAR & FOUNDRY CO., New York. Booth 318.—A 3-electrode heater for heating rivets and a single-electrode twopath heater for heating material for forging or upsetting will be operated in this company's booth. F. C. Cheston, John S. Helt and Harold C. Cheston will be in charge.

AMERICAN ELECTRIC FURNACE CO., Boston. Booths 402, 439.—An 8 x 16-inch high-speed furnace and a 12 x 24-inch box furnace will be operated while 12, 16 and 18-inch pot furnaces and a nitriding furnace will be displayed. Representatives will include K. A. Juthe, S. N. Juthe, A. J. Hanson, John C. Juthe, A. B. Beach, E. E. Bolds, A. A. Anderson, A. D. Heath, L. A. McCalla, L. A. Smith, W. P. Barba and W. T. Haggas.

AMERICAN ENGINEERING CO., Philadelphia. Booth 398.

AMERICAN GAS ASSOCIATION, New York. Booth in Gas Section.—The industrial gas section of the association is sponsoring the combined exhibit of manufacturers of gas furnaces and accessory equipment. The booth will be outfitted

Welding Society Program and Papers

THE American Welding society again will be a prominent participant in the National Metal Congress. For the third consecutive year this organization has arranged its fall meeting coincident with the annual convention of the American Society for Steel Treating and thereby conducts its welding and cutting exhibition as a major section of the National Metal exposition. As in previous years, one whole section of the exposition has been set aside for the display and demonstration of welding and cutting apparatus, welding accessories, and products fabricated by the gas and electric methods of joining metals into single structures.

Although registration begins on Monday morning and a board of directors meeting is scheduled for that afternoon, the program of the American Welding society will not officially commence until Tuesday morning. Headquarters will be maintained at the Hotel Statler and here the technical sessions of Tuesday, Thursday and Friday mornings will be held. Technical sessions on Tuesday, Wednesday and Thursday afternoons will be at the Public Auditorium, the one on Thursday afternoon being conducted jointly with the iron and steel division of the American Society of Mechanical Engineers. The American Bureau of Welding will convene on Friday afternoon at Hotel Statler.

Members of the welding society are invited to participate in plant visitation trips arranged by the American Society for Steel Treating, although one of their own has been planned for Wednesday morning. Plants open for visitation are listed on Page 513 of this issue. Welding society members will join with the Steel Treaters in the grand ball at Hotel Cleveland on Tuesday evening. The annual banquet and dance of the society will be at Hotel Statler on Thursday evening. Following is the detailed program of the American Welding society:

Monday, Sept. 9

MORNING

10:00 a. m.—Registration at Hotel Statler.
12:00 m.—Registration Public Auditorium.

AFTERNOON

2:00 p. m.—Meeting of board of directors. Hotel Statler.

Tuesday, Sept. 10

MORNING

10:00 a. m.—Business session. Hotel Statler. Chairman: F. T. Llewellyn, president.
10:30 a. m.—Technical session. Hotel Statler. Chairman: A. E. Gaynor, vice president.
"The Effect of Design of the Use of Welding in the Manufacture of Electric Machinery," by H. G. Reist, General Electric Co., Schenectady, N. Y.
"Cutting and Welding Steel Parts to Replace Castings," by W. F. Buchanan, Bessemer Gas Engine Co., Grove City, Pa.

AFTERNOON

2:00 p. m.—Technical session. Public Auditorium. Chairman: H. L. Whittemore, vice director, American Bureau of Welding.
"Welding of Copper and Copper Alloys," by I. T. Hook, research laboratory, American Brass Co., Waterbury, Conn.
"How To Test Welds," by F. G. Tatnall, Southwark Foundry & Machine Co., Philadelphia.

EVENING

9:00 p. m.—Grand ball at Hotel Cleveland.

Wednesday, Sept. 11

MORNING

8:30 a. m.—Plant inspection.
10:00 a. m.—Conference of research workers on "Fundamentals of Welding," Hotel Statler. Chairman: H. M. Hobart.

AFTERNOON

2:00 p. m.—Technical session. Public Auditorium. Chairman: J. J. Crowe.
"Study of Nitride Needles," by P. Alexander, General Electric Co., West Lynn, Mass.
"Chemical Reactions of the Carbon Arc," by G. E. Doan and E. E. Kholm, Lehigh university, Bethlehem, Pa.
"A Metallographic Study of Some Metal Arc Welds," by H. M. Boylston, Case School of Applied Science, Cleveland.
"Metallographic Studies of Welding and Cutting," by M. Yatsevitch, Watertown arsenal, Watertown, Mass.

EVENING

7:30 p. m.—Meeting of structural steel Welding committee. Hotel Statler. Chairman: J. H. Edwards.

Thursday, Sept. 12

MORNING

9:30 a. m.—Technical session. Hotel Statler. Chairman: F. T. Llewellyn, president.
Motion picture on "Gas Welded Steel Building."
"Gas Welding of Steel Building," by H. H. Moss, Linde Air Products Co., New York.
"Nondestructive Testing of Welds with the Stethoscope and X-Ray," by C. O. Burgess, A. B. Kinzel and A. R. Lytle, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.
"Welding Studies at the Watertown Arsenal," by Major J. B. Rose, ordnance department, United States army, Watertown, Mass.
"Stress-Strain Charactertistic of Welded Joints," by J. H. Smith, University of Pittsburgh, Pittsburgh.

AFTERNOON

2:00 p. m.—Joint technical session with American Society of Mechanical Engineers. Public Auditorium. Chairman: C. A. Adams, director, American Bureau of Welding.
"Foreign Practice in Welding of Boiler Tubes and Drums," by G. A. Orrok, consulting engineer, New York.
"Automatic Arc Welding of Thin Sheets," by W. L. Warner, General Electric Co., Schenectady, N. Y.
"Nondestructive Tests of Welds," by Elmer A. Sperry, Sperry Development Co., Brooklyn, N. Y.

EVENING

6:30 p. m.—Annual Banquet and dance. Hotel Statler.

Friday, Sept. 13

MORNING

10:00 a. m.—Technical Session. Hotel Statler. Chairman: J. C. Lincoln.
"Oxyacetylene Welding of Pipe Lines in the Field," by W. R. Ost, Air-Reduction Sales Co., New York.
"Electric Welding of Field Joints of Oil and Gas Pipe Lines," by H. C. Price, Welding Engineering Co., Bartlesville, Okla.
"Welding of Tubing and Pipes for Locomotives and Boilers," by H. A. Woofter, Swift Electric Welder Co., Detroit.

AFTERNOON

2:00 p. m.—Meeting of American Bureau of Welding. Hotel Statler. Chairman: Prof. C. A. Adams, director.

as a control laboratory operated under the direction of W. E. Jominy, research fellow of the association at the University of Michigan. The application of gas for certain fundamental metal treating and melting operations will be explained. Representatives will be E. D. Milener, C. W. Berghorn, A. M. Apmann, Karl Emmerling and J. C. Shanks.

AMERICAN GAS FURNACE CO., Elizabeth, N. J. Booth in Gas Section.—A continuous retort heating machine for hardening, annealing or tempering; a mesh wire conveyor heating machine; a reciprocating-hearth heating machine for hardening and annealing; a heating machine for tempering; a rotary brass melter; two high-speed oven furnaces; a large oven furnace; a rotary retort carburizer; and a vertical retort carburizer will constitute this manufacturer's display. In charge will be P. C. Osterman, Elmer C. Cook, Theodore Farwick, John Mehrman, William H. Kelsey, William J. Barenscheer and O. T. Muehlemeyer.

AMERICAN STEEL & WIRE CO., Chicago. Booth 265.—Welding wire and rods for gas and electric welding; cold-rolled strip steel; springs; screw stock; coated and plain wire nails; and manufacturing wire will comprise the exhibit of this company. Representatives will be F. Connell, G. S. Rose, A. G. Bussman, W. E. Mackley, E. S. Humphrys, C. J. McGregor, R. C. Fisher, W. H. Cordes, E. E. Louis, A. T. Merriman and P. G. Gilroy.

AMPCO TWIST DRILL CO., Jackson, Mich. Booth 312.—Two machines milling, drilling, reaming and burring 5/16-inch yoke ends at a production speed; a complete line of drills and small tools; and a new mandrel will be shown. Representatives will be O. Monrad, E. Loy, E. Leypoldt, R. Rice, D. O'Brien, Fred E. Kelley, F. J. Sikorovsky and George Melling.

ANCHOR DRAWN STEEL CO., Latrobe, Pa. Booths 10, 12, 39, 41.—Exhibiting drill rod; and special cold-drawn shapes of high-speed, stainless, carbon and alloy tool steels. R. C. McKenna, Floyd Rose and George Morrison will be in charge.

ARMSTRONG-BLUM MFG. CO., Chicago. Booth 383.—Operating in this booth will be a metal band saw; an automatic high-speed saw; two new hack saw machines; and high-speed hack saw blades containing 18 per cent tungsten. Harry J. Blum, Stanley A. Woleben, J. C. Fletcher, Walter S. Ryan, Allan M. Andrews, Harry A. Welch and John E. Van Doren will represent the company.

ARMSTRONG BROS. TOOL CO., Chicago. Booth 381.—Lathe, planer and shaper tools; drop-forged lathe dogs; clamps; ratchet drills; drilling posts; drop-forged wrenches; stocks and dies; pipe vises, cutters and wrenches; and machine shop specialties will make up this display with Paul L. Armstrong, A. Arbogast, George Nufer and W. Welter in charge.

ARMSTRONG CORK & INSULATION CO., Lancaster, Pa. Booth 98.—Corkboard insulation for constant temperature rooms and walls and roofs of buildings; cork coverings for insulating low temperature lines and tanks; insulating brick for boiler settings, heat treating furnaces and other high-temperature furnaces, ovens, kilns, etc.; and cork material for sound deadening and vibration absorption. H. B. Gates will be in charge.

AUTOMATIC NUT-THREAD CORP., Philadelphia. Booth 304.—Operating in this space will be two sizes of automatic nut tapping machines and a hand-operated tapping machine using bent shank tap and continuous tapping. Representing the company will be Eric M. de Sherbinin, Robert B. Webster, Christian S. Sorensen, Fred D. Creasop, Victor E. Pearson and Joseph T. Ramella.

AUTOMATIC TEMPERATURE CONTROL, INC., Philadelphia. Booth 351.—Apparatus for automatic control of temperature including two balancing 3-position controllers with anticipating features; a 3-position single-motor controller; a 2-position single-motor controller; a 3-position slow-motion controller operating 8-inch air and 1-inch oil valves; a proportional hand-control operating oil and air valves; and an electric heater controller. Attending will be G. S. Frazee, Ivan Johanson, R. A. Smart and J. D. Andrews.

B

BARNES, W. O., CO. INC., Detroit. Booth 406.—In operation at this booth will be a motor-driven hack sawing machine using high-speed steel hacksaws. Three display boards will show the company's products. W. O. Barnes, J. H. Flavell, F. M. Shaw, Roy Schindley, A. G. Young, J. M. Munro, C. B. Cecil, and L. Robertson will attend.

BASTIAN BLESSING CO., Chicago. Booth 239.—Will display oxyacetylene welding and cutting torches and regulators; manifolds; generators; high-pressure forged fittings; drum valves and accessories. Oxyacetylene welding of piping systems will be featured with sample welds being made. E. L. Mills, E. N. Stevens and Earl M. Evleth will be in charge.

BAUSCH & LOMB OPTICAL CO., Rochester, N. Y. Booths 7, 9.—A wide-field binocular microscope suitable for viewing opaque specimens; magnifiers and readers; microtones; colorimeters and other optical and measuring instruments; toolmaker's microscope; photomicrographic and projection apparatus; and metallographic equipment will constitute this company's exhibit. Represented by I. L. Nixon, M. H. Stevens, H. L. Shippy and A. R. Farmer.

BELL & GOSSETT CO., Chicago. Booths 344, 345.—Will display hardening room materials and equipment, including carburizing and hardening compounds, cyanide, drawing and hardening salts, nickel-chromium-aluminum alloy pots and boxes, lead pot covering, anticarburizing paint, pressed-steel pots, oil coolers, and several pot, box and magnetic-control electric furnaces in operation. Representing the company will be W. C. Bell, E. J. Gossett, J. S. Ayling and B. C. Cleveland.

BELLEVUE INDUSTRIAL FURNACE CO., Detroit. Booth 393.—This company will exhibit in operation a 25-kilowatt electric hardening and carburizing furnace, and a 40-kilowatt

Institute of Metals Program

ANOTHER group contributing in a major way to the National Metal Congress is the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers. This group of metallurgists and technicians holds many interests in common with the American Society for Steel Treating and it is of important benefit to both that meetings of the two organizations are arranged coincident. The Institute of Metals will make its headquarters at Hotel Cleveland and there technical sessions will be held on Tuesday and Thursday mornings. Members of the institute will attend the Campbell Memorial Lecture of the American Society for Steel Treating on Wednesday morning, while in the afternoon the two organizations have arranged a joint technical session in Public Auditorium. All plant visitations as listed on Page 513 of this issue are available to those interested, but in addition, a special trip to the Nela Park plant of National Lamp Works will be made on Thursday afternoon. The institute will join with the iron and steel division of the Institute of Mining and Metallurgical Engineers at a dinner at Hotel Cleveland on Tuesday evening and later will attend the grand ball at Hotel Cleveland. Following is the complete program of events:

Tuesday, Sept. 10

MORNING

10:00 a. m.—Technical session. Secondary metal symposium. Hotel Cleveland. Chairman: E. A. Wright.

"Manufacture of Wire Bars from Secondary Copper,' 'by J. W. Scott and W. A. Scheuch, Western Electric Co., Hawthorne Station, Chicago.

"Metal Recoveries in Secondary Aluminum Practice," by R. J. Anderson, Fairmont Mfg. Co., Fairmont, W. Va.

"Reclaiming Nonferrous Scrap Metals at Manufacturing Plant," by F. N. Flynn, metallurgist, Milwaukee.

"Utilization of Secondary Metals in the Red Brass Industry," by H. M. St. John, Detroit Lubricator Co., Detroit.

"The Recovery of Waste from Tin Base Babbitting Operations," by J. P. Potter, Federal Mogul Corp., Detroit.

EVENING

6:30 p. m.—Joint dinner, with Iron and Steel division, American Institute of Mining and Metallurgical Engineers. Hotel Cleveland.

Speakers: Floyd T. Taylor, vice president, Hanson, Van Winkle, Munning Co., Cleveland; and Dr. H. W. Gillett, director, Battelle Memorial Institute, Columbus, O.

9:30 p. m.—Grand ball at Hotel Cleveland.

Wednesday, Sept. 11

MORNING

10:30 a. m.—Joint session with American Society for Steel Treating. E. D. Campbell Memorial Lecture. Hotel Cleveland. Chairman: H. M. Boylston.

"Steel at Elevated Temperatures," by Dr. Albert Sauveur, Harvard university, Cambridge, Mass.

AFTERNOON

2:00 p. m.—Joint technical session with American Society for Steel Treating. Public Auditorium. Chairman: P. D. Merica.

"Preparation of Microsections of Tungsten Carbide," by Dr. S. L. Hoyt, General Electric Co., Schenectady, N. Y.

"Radiography as a Tool in the Metal Industry," by W. L. Fink, and R. S. Archer, Aluminum Co. of America, Cleveland.

"Effects of Cold Working on the Physical Properties of Metals," by R. L. Templin, Aluminum Co. of America, New Kensington, Pa.

"Determining Orientation of Crystals in Rolled Metal from X-Ray Patterns Taken by the Monochromatic Pin-Hole Method," by W. P. Davey, C. C. Nitchie and M. L. Fuller, New Jersey Zinc Co., Palmerton, Pa.

"Effect of Heat Treatment on Properties and Microstructure of Brittania Metal," by B. Egeberg and H. B. Smith, International Silver Co., Meriden, Conn.

Thursday, Sept. 12

MORNING

10:00 a. m.—Technical session. Hotel Cleveland. Chairman: Dr. S. L. Hoyt.

"Metallography of Commercial Thorium," by Edmund S. Davenport, Westinghouse Lamp Works, Bloomfield, N. J.

"The System Cadmium-Mercury," by R. F. Mehl and C. S. Barrett, Naval Research Laboratory, Anacostia, D. C.

"Deoxidation of Copper with Calcium and Properties of Some Copper-Calcium Alloys," by E. E. Schumacher, W. O. Ellis and J. F. Eckel.

"The Causes of Cuppy Wire," by W. E. Remmers, Western Electric Co., Hawthorne Station, Chicago.

"An Investigation To Determine the Eutectic Composition of Copper and Tin," by G. O. Hiers and G. P. deForest, research laboratory, National Lead Co., Brooklyn, N. Y.

"Notes on the Crystal Structure of Alpha Copper-Tin Alloys," by R. F. Mehl and C. S. Barrett, Naval Research Laboratory, Anacostia, D. C.

"The Effect of Alloying on the Permissible Fiber Stress in Corrugated Zinc Roofing," by E. A. Anderson, New Jersey Zinc Co., Palmerton, Pa.

AFTERNOON

1:30 p. m.—Plant inspection to National Lamp Works, Nela Park.

high-temperature furnace equipped with nonmetallic heating elements for 2450 degrees Fahr. Attending this display will be Walter E. Hinz, Louis J. Raymo and Arnold Pfau Jr.

BELLIS HEAT TREATING CO., Branford, Conn. Booth 352.—Electric salt bath furnaces; and salts for tempering between 270 and 1200 degrees Fahr., hardening and annealing carbon steel between 1000 and 2000 degrees Fahr., and hardening high-speed steel between 2000 and 2500 degrees Fahr. will make up the display. A. E. Bellis, C. E. Wister and J. W. Black will be in charge.

BETHLEHEM STEEL CO., Bethlehem, Pa. Booths 44, 46, 65, 67.—Display will include airplane steels; forgings; test specimens pertinent to airplane engine building; tool steels; pig iron; steel sheets and structural sections. Among company representatives will be T. F. Fitzgibbons, F. H. Baldwin, J. H. Bateman, E. A. Buxton, G. P. Witteman, H. R. Weeman, D. C. Roscoe, H. W. Hibshman, W. E. Titus, R. S. Tucker, H. E. Graffin, G. Cushman, J. W. Codding, F. E. Fisher, R. MacDonald, W. B. Pritchard, W. R. Shimer, J. H. Stoll, A. P. Spooner, P. E. McKinney and J. F. Gaffney.

BINGHAMTON FLEXIBLE SHAFT CO., Binghamton, N. Y. Booth 365.

BLISS & LAUGHLIN INC., Harvey, Ill. Booth 72.—Will exhibit cold-drawn steel, turned and polished shafting, turned and ground shafting, special finished steel, and parts made from the various steels. W. P. Mitchell, C. L. Huff, George Spaulding, C. H. Beach and T. D. Taylor will be in attendance.

BOTFIELD REFRACTORIES CO., Philadelphia. Booth 210.—Included in this display will be firebrick cement; refractory material for use in laying up firebrick where unusually severe conditions are encountered; a refractory aggregate for surfacing refractory linings; an air gun for applying the aggregate; and a plastic patching material for quick and emergency repairs. A. H. Engstron and W. B. Smith will be in charge.

BOURNE-FULLER CO., Cleveland. Booths 25, 27.—This manufacturer will show specimens of steel sections rolled in carbon and alloy steels; and bolts, nuts and rivets used in the aircraft, automotive, railroad and other industries. Representatives will be H. H. Pleasance, C. F. Newpher, N. C. Bolton, R. C. Klemm, H. D. Burket and R. D. Titus.

BRISTOL CO., Waterbury, Conn. Booth 386.—Will show indicating and recording pyrometers; automatic temperature control equipment; motor valves for gas, oil, air and steam; special pyrometer for automatically controlling hot blast temperatures on blast furnaces; safety set screws; and belt lacing. Attending will be H. L. Griggs, R. M. Walker, H. W. Moss, L. G. Bean, E. L. Stillson, Mr. Trumbull and W. F. Emery.

BROWN INSTRUMENT CO., Philadelphia. Booth 272.—To exhibit indicating, recording, controlling and signalling pyrometers; indicating and recording flow meters; recording and controlling thermometers; CO_2 meters; pressure gages; automatic control valves; thermocouples and protecting tubes. Company representatives will include G. W. Keller, O. B. Wilson, G. L. Clapper, J. L. Whitten and L. C. Wilson.

BROWN LYNCH SCOTT CO., Monmouth, Ill. Booth 388.—Will demonstrate a new style of carburizing compound cleaner and grader of all-steel construction, smaller than previous models but retaining a capacity of 1500 pounds of material per hour. In charge of J. A. Scott, W. B. Lynch and S. W. Perry.

C

CALORIZING CO., Pittsburgh. Booth 324.—This company will show a heat-resisting alloy cast into carburizing boxes, cyanide pots, hearth plates, rollers for continuous furnace operation, etc.; and steel parts, such as oil still tubes, cyanide and salt pots, pyrometer protection tubes, bolts and nuts, etc., treated to render them heat resistant. B. J. Sayles, D. T. Downes, H. Schultz, N. E. Ward, R. S. Brown and N. A. Milmine will be the representatives.

CAMPBELL, ANDREW C., INC., Bridgeport, Conn. Booth 403.—Three nibbling machines will be demonstrated cutting metal of various thicknesses. H. R. Powell and J. Johnson will be in charge.

CARBOLOY CO. INC., New York. Booths 255, 325.—Will operate a turret lathe equipped with tungsten-carbide cutting tools and run at high production speeds on various steels, irons, bronzes and other materials. In addition, tungsten-carbide tools in various shapes and styles and wire drawing dies made from the same material will be shown. Representatives will be P. R. Mallory, E. H. Wilkinson, A. R. Howell, G. V. Rockey, G. N. Sieger, Zay Jeffries, A. A. Merry, W. G. Robbins, W. W. Fullager, W. J. Lindner, P. Petroff, W. H. Martin and W. S. Huson.

CARBORUNDUM CO., Perth Amboy, N. J. Booths 347, 387.—This company will show a complete assortment of refractory materials, including brick, tile, special shapes, cement, grain and firesand. A nonmetallic resistor electric furnace will be operated to demonstrate the relative thermal conductivity of various refractory and insulating materials. Furnace chamber design will be explained. Represented by C. E. Hawke, W. M. Smith, R. A. Beverly, S. F. Fenno, J. A. King, R. A. Barr and W. C. Thiess.

CARBORUNDUM CO., Niagara Falls, N. Y. Booths 346, 347, 387, 389.—A complete line of abrasives and grinding wheels will be shown; also nonmetallic furnace heating elements and terminals. Representatives will include S. F. Courter, G. W. Chormann, B. W. Work, E. C. Christensen, W. U. Parrott and H. W. Collinson.

CARPENTER STEEL CO., Reading, Pa. Booth 81.—This company will demonstrate the ease with which stainless steel can be machined, including turning, drilling, tapping, threading and broaching at the same speeds and feeds as used on screw stock. Five grades of stainless steel will be shown. The representatives will be F. A. Bigelow, J. H. Parker, R. V. Mann, F. R. Palmer, B. H. DeLong, G. V. Luerssen, P. B. Greenawald, G. H. Edmonds, W. M. Loos, C. A. Heil, R. L. Williams, K. L. Krickman, V. W. Gardner, H. G. Roodhuyzen, J. S. Bailey, C. H. Breed and E. von Hambach.

CASE HARDENING SERVICE CO., Cleveland. Booths 344, 345.—Will display hardening room materials and equipment, including carburizing and hardening compounds, cyanide, drawing and hardening salts, nickel-chromium-aluminum alloy pots and boxes, lead pot covering, anticarburizing paint, pressed-steel pots, oil coolers; and several pot, box and magnetic-control electric furnaces in operation. Representing the company will be W. C. Bell, E. J. Gossett, J. S. Ayling and B. C. Cleveland.

CENTRAL ALLOY STEEL CORP., Massillon, O. Booths 14, 16, 43, 45.—This company will display alloy steels, copper-molybdenum iron, corrosion resistant steel and case hardening steel. Represented by B. F. Fairless, J. M. Schlendorf, W. M. Garrigues, M. J. R. Morris, F. L. Gibbons, A. Schaeffer and D. B. Carson.

CHAR PRODUCTS CO., Indianapolis. Booth 377.—To display a full line of carburizing compounds and carbon products, demonstrating the nonburning qualities and resistance to abrasion. C. Q. Swenson, C. B. Edwards and William Higburg will be in charge.

CHEMICAL RUBBER CO., Cleveland. Booth 283.—Exhibiting: Laboratory equipment of special interest to the metal industry. In attendance will be A. Friedman, E. Hartle and I. W. Brandel.

CHICAGO STEEL & WIRE CO., Chicago. Booths 315, 317.

CHICAGO STEEL FOUNDRY CO., Chicago. Booths 285, 287.—This company will exhibit chrome-nickel alloy castings for use at high temperatures, boxes, pots, furnace parts, sheet alloy fabricated parts and special high-strength chrome-nickel castings. David Evans, C. M. Evans, Herman Georgen, J. W. Frank, W. J. Chapin and Gordon McMillan will be in charge.

CHROBALTIC TOOL CO., Michigan City, Ind. Booth 204.—Exhibit will include heat-resisting and acid-resisting castings illustrating modern ideas in engineering design in carburizing pots and boxes in conjunction with pusher grids and trays, rails, retorts and miscellaneous metallurgical equipment. In attendance: W. B. Sullivan, L. H. Whiteside, C. M. Conner, J. F. Sweeney, A. A. Cash, O. G. Voss, T. A. Meyer, Charles Peterson, H. Klouman and E. Whiteside.

CLARK, JAMES JR., ELECTRIC CO., Louisville, Ky. Booth 365.

CLARK TRUCTRACTOR CO., Battle Creek,

A. S. M. E. Joins Congress

A NEW group to schedule a meeting in conjunction with the National Metal congress is the iron and steel division of the American Society of Mechanical Engineers. This group will begin its meetings on Wednesday afternoon and will continue through to Friday evening. Headquarters will be at the Hotel Hollenden. Technical sessions will be held at the Public Auditorium on Wednesday, Thursday and Friday afternoons, the Wednesday session being conducted jointly with the American Welding society and the Friday session arranged jointly with the American Society for Steel Treating. A session also will be held Friday morning at the Hotel Hollenden. Thursday morning the engineers will visit the Cleveland & Pittsburgh ore docks and the Cuyahoga works of the American Steel & Wire Co. A banquet will be served at the Hotel Hollenden on Friday evening and will conclude the program. Eleven technical papers have been scheduled for presentation at the various sessions as follows:

Wednesday, Sept. 11

AFTERNOON

Technical session. Public auditorium.
- "Developments in Blast Furnaces—Design and Practice," by Arthur G. McKee, Arthur G. McKee & Co., Cleveland.
- "Ore Handling Bridges," by Alexander C. Brown, Industrial Brown Hoist Corp., Cleveland.
- "Oil-Electric Locomotives in Steel Mill Transportation," by W. L. Garrison, Ingersoll-Rand Co., New York.

Thursday, Sept. 12

MORNING

Plant inspection.

AFTERNOON

Joint session with American Welding Society. Public Auditorium.
- "Foreign Practice in Welding of Boiler Tubes and Drums," by G. A. Orrok, consulting engineer, New York.
- "Automatic Arc Welding of Thin Sheets," by W. L. Warner, General Electric Co., Schenectady, N. Y.
- "Nondestructive Tests of Welds," by Elmer A. Sperry, Sperry Development Co., Brooklyn, N. Y.

Friday, Sept. 13

MORNING

Technical session. Hotel Hollenden.
- "Alloy Steels in Iron and Steel Mill Equipment," by M. J. R. Morris, Central Alloy Steel Corp., Massillon, O.
- "Evolution of Drives for Mill Table Rollers," by K. Feller, Schloemann Engineering Co., Pittsburgh.

AFTERNOON

Joint technical session with American Society for Steel Treating. Public Auditorium.
- "Distribution of Heat in Combustion Furnaces," by M. H. Mawhinney, Electric Furnace Co., Salem, O.
- "Advantages of Producer Gas as a Fuel Compared with Other Forms of Fuel," by Victor Windett, Wellman-Seaver-Morgan Co., Cleveland.
- "Powdered Coal Cupola," by D. H. Meloche, American Radiator Co., New York.

EVENING

Banquet at Hotel Hollenden.

Mich. Booth 102.—Exhibiting 5-ton lift truck, gas-powered industrial lift truck, four-wheeled gas-powered factory tractor fully equipped, three-wheel small tractor with turning radius of 51 inches, and 2-ton auto end dump tractor. C. E. Staninger, Everett M. Sharp, R. J. Burrows, C. I. Ucker and G. A. Smith will represent the company.

CLEVELAND TWIST DRILL CO., Cleveland. Booths 408, 409, 427.—Exhibits will include in operation two high-speed drill presses demonstrating high-speed drills and various speeds and feeds, and a complete display of tools among which will be high-speed drills and reamers tipped with tungsten carbide. In attendance: W. E. Caldwell, J. B. Dillard, H. P. Jensen, for the first time in the United States; micrometer fluid gage; divided machine vises; hand tachometers and speed recording indicators; and a scale preventative. Charles E. Coats is representing the company.

COLONIAL STEEL CO., Pittsburgh. Booths 10, 12, 39, 41.—Exhibit will include a new high-carbon, high-chromium air hardening die steel; a special carbon-vanadium crucible made tool steel; a carbon tool steel; stainless irons and steels; high-speed alloy and carbon tool steel sheets; high-speed alloy and carbon tool steel rings, disks and special forgings; copper-clad ground rods and line material; hot-rolled special shapes; plow steel, soft center; jail bar and safe steel; mining drill steel, solid and hollow; and special die blocks. In attendance: R. C. McKenna, Floyd Rose, Lawrence Wood, J. P. Gill, N. B. Hoffman, H. M. Bray, George Morrison, F. L. Stevenson, R. W. Harris and Charles Schnibble.

COLT'S PATENT FIRE ARMS MFG. CO., Hartford, Conn. Booth 437.—A two-tank conveyor machine; drying machine and other metal parts cleaning units; switches, fuses and service boxes will be on display. George Webb, H. S. Seiferman, C. M. Jackson, G. E. MacManus and F. R. Murphy will be in attendance at the booth.

COLUMBIA TOOL STEEL CO., Chicago Heights, Ill. Booth 62.—Exhibiting alloys, tool steel, ingots, etc. The company will be represented by Arthur T. Clarage, G. C. Beebe, W. G. Sonderman, E. D. Roberts and E. W. Luecht.

CRUCIBLE STEEL CO. OF AMERICA, New York. Booths 38, 40, 42, 63.—Featuring a display of corrosion resisting articles; illuminated pictures of various steelworks; also crucible, open-hearth and electric melting practice. Representatives will be B. F. Hufnagel, J. A. Mathews, A. T. Galbraith, J. M. McComb, H. L. Gellinger, R. Michener, R. E. Christie, J. P. Jayme, E. P. Gaffney, R. H. Heatley, F. E. Phelps, R. W. Crane, M. S. Dravo, R. C. Webster and J. T. Carroll.

D

DAILY METAL TRADE, Cleveland. Booth 308.—At this booth will be available copies of publications of the Penton Publishing Co. and technical books. The space will be fitted up as a rest room and all who attend the exposition are cordially invited to make their headquarters here. Representatives will be C. J. Stark, J. D. Pease, E. L. Shaner, G. O. Hays, John Henry, S. H. Jasper, W. S. Doxsey, H. N. Pickett, F. F. Light, E. C. Barringer, E. F. Ross, J. D. Knox, A. H. Allen, H. B. Veith, and F. B. Jacobs.

DARDELET THREADLOCK CORP., New York. Booth 276.—An operating exhibit of vibrating machine, bolt threader, nut tapper, test specimens, samples of taps, dies, nuts and bolts. In attendance: A. Morris Thomson, Charles J. Gass, William E. Hoke and Norman C. McLoud.

DARWIN & MILNER INC., Cleveland. Booths 66, 87.—Exhibiting a full line of tool steels with specimens of dies and samples of work done by them; cast dies, etc., made from cobalt-chromium steel; magnets made of cobalt magnet steel; hacksaw blades; special steels from English works of the company; and safety razor blades made of cobalt-chromium steel. Victor F. J. Tlach, John C. Koch, Harry L. Harrison, C. F. Lear, Max Opp, Herman O. Baberadt, H. J. Burnett, C. A. Bowman and H. R. Bowman Jr. will be in attendance.

DEARBORN CHEMICAL CO., Chicago. Booth 92.—Samples and literature pertaining to the company's patented rust preventative, cleaners, feed water treatment, and hot water system treatment will be on display. Company representatives will be E. M. Converse, C. A. Remsen, J. A. Crenner, C. I. Loudenback and E. H. Ruhlman.

DE SANNO, A. P., & SON, Philadelphia. Booth 376.—Display will feature cutoff machines for cutting materials with abrasive wheels. A. P. De Sanno Sr., Alphonso De Burnay, Benjamin G. Hardy and L. C. Buckingham will be in the booth.

DETROIT ALLOY STEEL CO., Detroit. Booth 326A.—Exhibiting wood patterns used in manufacturing alloy tool castings, alloy tool steel castings as cast, and pressed metal dies made from alloy tool steel. Representing the company: High Martin, H. H. Wyatt, H. F. Kluender and W. A. Spindler.

DEWALT PRODUCTS CORP., Leola, Pa. Booth 320.—Operating exhibit including portable electric woodworker, circular saw metal cutting unit and a 6-inch jointer. In attendance: Paul Gardner, Robert H. Mulch, L. J. McLaughlin and J. C. Mann.

DONNER STEEL CO. INC., Buffalo. Booth 412.—Exhibiting cold-drawn bars and die-rolled parts. W. F. Vosmer, A. G. Greenamyer, C. A. Cherry, D. G. Baxter, R. E. Sherlock, W. C. Peterson, L. C. Miller, F. H. Lammert, P. M. Guba, H. C. Richardson and E. D. Pumphrey.

DRIVER-HARRIS CO., Harrison, N. J. Booths 64, 65.—Company will display nickel-chrome castings, retorts, carburizing boxes, pyrometer tubes, furnace parts, sheet carburizing containers and a variety of parts made of nickel-chromium alloy. Company representatives will be F. L. Driver Jr., S. M. Tracy, Harry D. McKinney, G. A. Lennox, W. E. Blythe, L. H. Waldrip, J. C. Bilek, J. C. Henderson and J. B. Shelby.

DURALOY CO., Pittsburgh. Booth 208.—Exhibit will include recuperator on rod heating furnace, model of normalizing furnace, sheet piler, section of a typical sheath-type shaft, Y-valves, miscellaneous pipe fittings, cast impeller, hearth plate, rolling mill guides and miscellaneous photographs and photomicrographs, also samples of various alloys made by company. C. P. Mills, E. S. Lawrence and H. Hobbs will be in attendance at the booth.

DURIRON CO. INC., Dayton, O. Booth 359.—Exhibiting centrifugal pump, in operation; Y-valves, plungers and release valves; together with other valves, pipe fittings, tanks, circulating steam jets, fans and raw material made and used by the company. Representatives at the booth will be E. B. Thacker, W. B. Earnshaw, M. W. Smith, R. Rourke and E. D. Brauns.

E

EASTMAN KODAK CO., Rochester, N. Y., Booth 5.—A display of X-ray negatives and photographs of castings, showing internal flaws detected by x-ray examination. E. E. Smith will be in charge of the exhibit.

ECLIPSE FUEL ENGINEERING CO., Rockford, Ill. Booth in Gas Section.—Exhibiting an oven furnace with special controls, injectors and burners of various kinds, gas forge, high-pressure gas, high-speed steel furnace, blast boiler, automatic shop room furnace, gas-fired automatic boilers and pressed steel pots. O. M. Olsen, Kurt A. Scharban, D. A. Campbell, O. N. Sellers and E. A. Stoner will represent the company.

Mining Engineers Program

AN INTERESTING technical program has been arranged by the Iron and Steel division of the American Institute of Mining and Metallurgical Engineers, another new group to participate in events of the National Metal congress. Hotel Cleveland has been designated as official headquarters. The division will start its activities with a session at Public Auditorium on Tuesday afternoon. A session is scheduled for Wednesday morning at Hotel Cleveland and another for Thursday afternoon at the Auditorium. On Thursday morning the engineers will join the iron and steel engineers of the American Society of Mechanical Engineers for a visit to the Cleveland & Pittsburgh ore docks and the Cuyahoga works of the American Steel & Wire Co. The Iron and Steel and Institute of Metals divisions of the American Institute of Mining and Metallurgical Engineers will join in a dinner at Hotel Cleveland on Tuesday evening. Following is the detailed program for the Iron and Steel division:

Tuesday, Sept. 10

AFTERNOON

Technical session. Public Auditorium.

"The Change in Microstructure of Iron at the A_3 Transformation Points," by B. A. Rogers, Western Electric Co., Chicago.

"A New Development in Wrought Iron Manufacture," by James Aston, Carnegie Institute of Technology, Pittsburgh.

"Viscosity of Blast Furnace Slags," by R. S. McCaffery, University of Wisconsin, Madison, Wis.

EVENING

Joint dinner with Institute of Metals, Hotel Cleveland.

Wednesday, Sept. 11

MORNING

Technical session. Hotel Cleveland.

"Fluorspar and Its Uses," by Earl Brokenshire, Oglebay, Norton & Co., Cleveland.

"Foreign Iron Ores," by Charles Hart, Delaware River Steel Co., Chester, Pa.

"Iron Ore Sinter," by G. M. Schwartz, University of Minnesota, Minneapolis.

"The Bradley Process for the Beneficiation of Manganiferous Ores," by Carl Zapffe, Northern Pacific railroad, Brainerd, Minn.

Thursday, Sept. 12

MORNING

Plant inspection.

AFTERNOON

Technical session. Public Auditorium.

"The Diffusion of Iron Oxide from Slag to Metal in the Open-Hearth Process," by C. H. Herty Jr., United States bureau of mines, Pittsburgh.

"Experimental Determination of Equilibrium in the System Carbon—FeO in Molten Iron," by A. B. Kinzel and J. J. Egan, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.

"Rate of Carbon Drop and Degree of Oxidation of the Metal Bath in Basic Open-Hearth Practice—II," by A. L. Feild, Union Carbide & Carbon Co., New York.

EGEBERG, BIRGER, Meriden, Conn. Booth 410.—Will exhibit in operation a volumetric carbon determination apparatus; an optical pyrometer and quick acting laboratory balance. Birger Egeberg will be in charge.

ELECTRIC STEEL FOUNDERS' RESEARCH GROUP, Chicago. Booths 89, 91, 93.—Featuring a display of small and medium size steel castings of various types of steels, physical test specimens, physical test report data and miscellaneous photographs. R. A. Bull, C. N. Ring and representatives of group companies will be present.

ELECTRO ALLOYS CO., Elyria, O. Booths 348, 385.—Exhibiting alloy castings of various types such as used in electric furnace construction and heat treating department equipment. Representatives: W. J. Hansen, H. P. Miller, A. M. Miller Jr., J. W. Henry, J. B. Thomas, A. L. Garford and W. C. Whyte.

ELECTRO REFRACTORIES CORP., Buffalo. Booth 15.—The company will exhibit silicon carbide brick in various shapes, high-temperature cement, electrically fused nonspalling magnesite brick, crucibles and patch cement. Representatives in attendance will be L. U. Milward, C. A. Asher, G. S. Diamond, C. L. Miller, C. F. Leitten, C. B. Davis Jr., T. W. Campbell and D. B. Milward.

ELKON INC., DIVISION OF P. R. MALLORY CO. INC., Indianapolis, Ind. Booths 259, 260.—A display of the various welding electrodes and dies manufactured by the company. A. O. Brauen, E. W. Brewer, L. F. Crease, C. R. Frede, J. F. Jenks, E. O. Oberdick, G. V. Rocky, G. N. Sieger, J. A. Toleik, R. R. Tomkins and J. A. Weiger will be in attendance.

ELLWOOD IVINS' STEEL TUBE WORKS, Philadelphia. Booth 410.—The company will exhibit seamless steel and aluminum tubing, seamless duralumin tubing and seamless alloy tubing. In attendance will be Horace S. Kircher, Stanley Jeffries and Henry W. Avery.

ENDICOTT FORGING & MFG. CO. INC., Endicott, N. Y. Booth 90.—Steel drop forgings used in airplane, automobile and machinery fabrication will comprise the exhibit of this company. S. J. Marshall, T. B. Kelday and George B. Reed will represent the organization.

ENDURO NIROSTA COMMITTEE. Booth 11.—Exhibiting applications of noncorrosive heat-resisting steel in various fabricated forms. In attendance: Representatives from Central Alloy Steel Corp., Massillon, O.; Ludlum Steel Co., Watervliet, N. Y.; and Babcock & Wilcox Tube Co., New York.

EVANS-WALLOWER ZINC CO., New York. Booth 397.

F

FALLS ELECTRIC FURNACE CORP., Buffalo. Booth 341.—An operating exhibit of general heat treating furnaces of the box type; also sample sections of full formed radiating sheet units. H. J. McCauley, J. R. Eves and T. J. Llewellyn will be in charge.

FEDERAL MACHINE & WELDER CO., Warren, O. Booths 226, 228.—Exhibiting portable, semiautomatic and full automatic butt welders, spot welder and projection welder. In attendance: H. L. McCreery and J. R. Kilpatriek.

FERNER, R. Y., CO., Washington. Both 374.—This company will exhibit in operation a new model of a Swiss jig borer with universal tiltable, new models of micro-indicator, tubes and stands for high-precision measurements, universal measuring machine and measuring microscopes of high precision. In attendance will be R. Y. Ferner, Fernand Turrettini, Walter S. Ryan, John Cetrule, Lambert Neff and Charles T. Ameel.

FERRY CAP & SET SCREW CO., Cleveland. Booth 211.—The company will exhibit finished products including spring bolts, alloy steel parts, screw machine parts, standard cap and set screws and acorn nuts. H. D. North, H. B. Pulsifer, E. W. Ferry E. G. Greene, H. A. Keith and William Murphy will represent the company.

FINKL, A., & SONS CO., Chicago. Booth 77.—Exhibiting photographs of plant equipment and products. In attendance: E. H. Graham, T. P. Wallace, J. M. Curley, W. H. Rieger, J. C. Vance, C. E. Finkl, Fred Finkl, Frank Finkl, William Finkl and M. R. Chase.

FIRTH-STERLING STEEL CO., McKeesport, Pa. Booths 69, 71.—An operating exhibit of a special lathe for high-speed operation, demonstrating new tungsten carbide cutting tools. Representatives: L. Gerald Firth, D. G. Clark, Robert S. Stevick, G. J. Comstock, O. K. Parmiter, A. S. Martin, C. G. Thoma, A. E. Barker, O. T. Smith, H. I. Moore, E. T. Jackman, G. A. Jacobs, W. C. Royce, W. J. MacFarland, J. V. Little, R. F. Kimber, F. N. Mead, I. Olsen, Harry Jarvis, Fred Jarvis, G. R. Bunting, J. Johnson and W. A. Ruppel.

FLANNERY MFG. CO, Pittsburgh. Booth 866.—A display will be offered of various sizes of nickel-coated pots for use in heat treating, annealing and cyaniding steels. J. Rogers Flannery, E. G. Flannery, H. D. Tietz, G. R. Greenslade and John J. Kenney will represent the company.

FORD, J. B., CO., Wyandotte, Mich. Booth 76.—Featuring a display of the complete line of cleaners which the company manufactures for cleaning metals preparatory to finishing operations. In attendance: B. N. Goodell, W. M. Cole, G. J. Lawrence, S. H. Renton, C. S. Shuler, R. W. Holt, J. W. Wolcott, F. O. Weber and Jack McClean.

G

GARLOCK PACKING CO., Palmyra, N. Y. Booth 339.—This company will exhibit a complete line of mechanical packings. Attending will be R. W. Perkins, B. B. Franklin and C. E. Hermansader.

Many Plants To Be Visited

CLEVELAND is one of the nation's important industrial cities, particularly in iron and steel and metalworking, consequently its manufacturing plants are of interest to the visitor. Through arrangement with the societies participating in the National Metal congress some 24 establishments will open their doors that those interested can inspect processes and products. Eighteen separate trips have been scheduled, three for Tuesday morning, one for Tuesday afternoon, five for Wednesday morning, four for Thursday morning, and five for Friday morning. Members and guests of all societies are privileged to join parties to the various plants. Following is the complete schedule of visitations:

TUESDAY, SEPT. 10

9:15 A.M.

National Tool Co., 11200 Madison avenue. (Metal-cutting tools.)

Lamson & Sessions Co., Eighty-fifth street and Madison avenue. (Bolts and nuts.)

Otis Steel Co., Riverside plant, 3341 Jennings road. (Steelmaking and rolling.)

2:00 P.M.

Case School of Applied Science, Euclid avenue opposite Wade park. (Metallurgical and testing laboratories.)

WEDNESDAY, SEPT. 11

8:30 A.M.

Burdett Oxygen Co., 3300 Lakeside avenue (Oxygen manufacture); **Joseph T. Ryerson & Son Inc.**, 5414 Lakeside avenue (Metal-cutting); and **Lincoln Electric Co.**, 12818 Coit road. (Arc welding equipment and motor manufacture.)

9:15 A.M.

Industrial Brown Hoist Corp., 4403 St. Clair avenue. (Materials handling machinery.)

Columbia Axle Co., 850 East Seventy-second street (Automobile axles); and **Lakeside Steel Improvement Co.**, 5418 Lakeside avenue (Commercial heat treating.)

White Motor Co., 842 East Seventy-ninth street. (Motor trucks and buses.)

Warner & Swasey Co., 5701 Carnegie avenue. (Turret lathes.)

THURSDAY, SEPT. 12

8:30 A.M.

Cleveland & Pittsburgh Ore Dock Co., Lake front. (Iron ore docks); and **American Steel & Wire Co.**, Cuyahoga works, Harvard avenue and East Forty-second street. (Wire making.)

Vichek Tool Co., 3000 East Eighty-seventh street (Drop forged tools); and **Gears & Forgings Inc.**, 3010 Woodhill road. (Gears and forgings.)

Eaton Axle & Spring Co., Bumper division, East Sixty-fifth and Central avenue. (Automobile bumpers, springs and accessories.)

Ferro Machine & Foundry Co., 3155 East Sixty-sixth street (Gray iron foundry); and **National Malleable & Steel Castings Co.**, 10600 Quincy avenue. (Malleable iron foundry.)

FRIDAY, SEPT. 13

9:15 A.M.

National Acme Co., 131st street and Coit road. (Screw machine products.)

Hupp Motor Car Corp., East 131st street and St. Clair avenue. (Automobiles.)

Great Lakes Aircraft Corp., 16800 St. Clair avenue. (Airplanes.)

Cleveland Tractor Co., Euclid avenue and East 193rd street. (Tractors.)

W. S. Bidle Co., 1408 East Forty-seventh street. (Commercial heat treating.)

Tomkins, L. C. Warden and C. R. Beaubien.

FORT PITT STEEL CASTINGS CO., McKeesport, Pa. Booths 89, 91.—Exhibiting electric steel castings.

FUSION WELDING CORP., Chicago. Booths 315, 317.—An operating exhibit will be conducted demonstrating the line of equipment and supplies which the company manufactures for fusion welding and cutting; also a demonstration of the arc process for welding thin sheets of various materials. Company representatives: R. F. Beazell, J. B. Green, L. F. Collins, E. J.

GAS PRODUCTS CO., Cleveland. Booth 239.—The company will display oxygen and acetylene gas supplies and welding supplies. S. M. Wells will be in charge of the booth.

GATHMANN ENGINEERING CO., Baltimore. Booth 1.

GEHNRICH OVEN CO. INC., Long Island City. Booth in Gas Section.

GENERAL ALLOYS CO., Boston. Booths 32, 53.—Exhibiting a full line of nickel-chromium heat treating containers and furnace parts; carburizing boxes; carburizing tubes;

and lead, salt and cyanide pots. Representing the company will be H. H. Harris, W. K. Leach, G. C. McCormick, W. R. Blair, F. J. Blaney, J. J. Baum, J. J. Donovan, W. A. Toohill, A. L. Grinell, J. H. Abbott, R. M. Kirk, Ralph Hare, H. G. Chase, E. R. Dougherty, C. E. Malley, J. C. Van Arman and R. N. Graves.

GENERAL ELECTRIC CO., Schenectady, N. Y. Booths 256, 257, 258, 319, 321, 323.

GIBB WELDING MACHINES CO., Bay City, Mich. Booth 237.—An operating exhibit of spot welders, welding presses and electric seam welders. Representing the company will be W. H. Gibb, C. E. Shearer and W. O. Little.

GLOBAR CORP., Niagara Falls, N. Y. Booths 346, 347, 387, 389.—The exhibit will demonstrate in operation 10-kilowatt electric heating elements in a special furnace. A. H. Heyroth, K. E. Rogers, B. A. Bovee, W. S. Evans and N. H. Berry will represent the company.

H

HALCOMB STEEL CO., Syracuse, N. Y. Booths 59, 61.—An exhibit including aircraft parts, tool alloys, noncorrosive and special steels and alloys. Representing the company will be H. A. Pardee, H. J. Stagg, J. T. Leyden, S. C. Spalding, J. F. Kirwan, Arthur Schroeder, Howard Hinkley, T. F. Wood, Harold Barlow, Allan Fraser, Leslie Hawkridge and Lee Evans.

HARRINGTON CO., Philadelphia. Booth 433.—Trolleys and hoists including spur geared hoists, screw hoists, differential hoists and electric hoists of various capacities will be on display. R. E. Bishop, I. E. Bauer and J. A. Slaughter will be at the booth.

HARRIS CALORIFIC CO., Cleveland. Booth 234.—The company's exhibit will include welding regulators, welding torches, gas welding and cutting equipment and a complete line of general accessories for welding and cutting operations. J. M. Mathews, S. A. Oviatt, W. J. Krull and Otto Fathauer will be in charge of the displays.

HAYES, C. I., INC., Providence, R. I. Booth 390A.—A heat treating furnace equipped with special controls will be in operation in this exhibit. C. I. Hayes, J. E. Hines and C. G. Paulson will conduct the exhibit.

HAYNES STELLITE CO., Kokomo, Ind. Booth 230.—The company will feature a display of cutting tools and welding rods made of the cast tungsten carbide alloy which the company manufactures. Representatives: F. P. Gormely, F. T. McCurdy, W. A. Moore and E. E. Gordon will be in charge of the display.

HEPPENSTALL FORGE & KNIFE CO., Pittsburgh. Booth 82.—The exhibit will feature a complete working model of new lifting tongs, designed for lifting die blocks; also shear knives and die blocks which the company handles. C. W. Heppenstall, B. B. Weinberg, J. A. Succop, R. B. Heppenstall, George I. Allen, F. C. Moyer, George O. Desautels, Carl J. Sauer, A. J. Porter Jr., A. L. Wurster and L. A. Daines will represent the company.

HOUGHTON, E. F., & CO., Philadelphia. Booths 354, 355, 371, 373.

I

ILLINOIS STEEL CO., Chicago. Booths 58, 79.—Motion pictures will show basic processes of making steel and operations of the electric W. I. Howland Jr., R. Korsan, J. H. McKown, A. R. Williard, R. G. Glass, F. B. Mulvaney, E. Davidson, Fred W. Bendell, C. R. Moffat, James R. Mills, G. A. Price, G. Landrus, J. Hornbrook, W. H. Brainard, C. E. McIntyre, R. C. O'Neill, H. W. Parker, W. S. Saylor and C. T. Seibert.

INDEX MACHINERY CORP., Cincinnati. Booth 360.—Operating exhibit of filing and sawing machine, and multispindle drilling and tapping machine. Exhibit in charge of Joseph F. Geers, James J. Dillon and Max A. Knorpp.

INTERNATIONAL NICKEL CO. INC., New York. Booth 94.—Will display material to illustrate the widespread use of nickel and nickel alloys in industrial applications. In attendance will be T. H. Wickenden, Charles McKnight, H. J. French, N. B. Pilling, F. B. Coyle, J. S. Vanick, C. A. Crawford, R. J. McKay, T. J. Wood, O. B. J. Fraser, J. W. Sands, A. L. Roberts, D. E. Ackerman, R. L. Suhl, R. A. Wheeler, L. Muller-Thym, E. J. Bothwell and H. C. Armstrong.

INTERSTATE IRON & STEEL CO., Chicago. Booths 52, 73.

IRON TRADE REVIEW, Cleveland. Booth 308.—This booth will be fitted up as a restroom which those attending the exposition are invited to make their headquarters. Copies of publications of the Penton Publishing Co. and technical books will be available. Representatives will be C. J. Stark, J. D. Pease, E. L. Shaner, G. O. Hays, John Henry, S. H. Jasper, F. F. Light, E. C. Barringer, E. F. Ross, J. D. Knox, A. H. Allen, H. B. Veith, F. B. Jacobs, W. S. Doxsey and H. N. Pickett.

IRWIN LUMBER CO., Erie, Pa. Booth 338.

J

JESSOP, WILLIAM, & SONS INC., New York. Booth 23.—Reception room with literature pertaining to products of the company. In attendance: F. C. A. H. Lantsberry, Robert Ross, C. L. Bailey, Hans Johnson, G. J. MacQuarrie, H. S. Norman and L. H. Cummings.

JESSOP STEEL CO., Washington, Pa. Booth 8.—Exhibit will include tool steel bars, fractured pieces and microscope for examination, finished dies and parts made from tool steels, cold-rolled strip steel and razor blade steel, stainless steel articles and parts, finished cutlery of both stainless and carbon steel, and saws. In attendance: S. A. Grayson, R. E. Emery, F. T. Youngman, R. J. Murray, V. M. Wellman, D. J. Hanna, A. G. Lambert, W. A. Salt, C. M. Cunningham, W. J. Frederick and J. C. Dawson.

JOHNS-MANVILLE CORP., New York. Booth 395.—Insulations, covering the low as well as the high temperature field, will be shown, also building materials such as asbestos, shingles, industrial flooring and a complete line of packings. Attending will be Eugene Dowling, G. E. Grimshaw, J. W. Blenmaker and R. S. Hemmingson.

JONES & LAUGHLIN STEEL CORP., Pittsburgh. Booths 55, 57.—This company will exhibit hot-rolled and cold-finished steels including cold-finished steel sections, light-weight channels, junior beams, steel piling, tubular products, etc. In charge will be W. B. Todd, J. D. Allen, C. C. Henning, J. H. Flaherty, W. R. K. Scott, H. W. Graham, E. A. France, J. G. Hutchinson, A. A. Wagner, W. J. Bothwell, J. T. Ferris, J. W. Robinson, R. W. Light and W. E. Danz.

K

K-G WELDING & CUTTING CO. INC., New York. Booth 262.—Operating exhibit of acetylene generators, oil-burning equipment; all types of welding, gas welding and cutting torches; oxygen and acetylene regulators will comprise this display. Attending will be William D. Flannery, E. Brass, H. H. Kress, William Munn, P. Noren, John Evans and A. W. Carr.

KELLER MECHANICAL ENGINEERING CORP., Brooklyn, N. Y. Booths 407, 429.—Exhibit will include an automatic toolroom machine equipped with two-templet rigging and attachment for locating and jig boring, cutter and radius grinder, powerfeed unit with overarm and spindle, and a line of flexible shaft machines. Attending: S. A. Keller, A. S. Keller, Henry Schreiber, Charles Bitter, P. C. Renno, W. L. MacRae, E. D. Ashley, Arthur Jenner, and Paul Loewenberg.

KELLEY, J. W., CO., Cleveland. Booth 68.—This company will exhibit carburizing compounds, lead pot carbon, annealing carbon, quenching oil, tempering oil, industrial oil, heat treating salts, and tempering salts as well as a quenching and washing machine in operation. In charge of the exhibit will be J. W. Kelley, J. E. Burns, H. B. Northrup, P. E. Holder, H. M. Webb, P. J. Myall, J. H. Hopp and C. F. Boyd.

KELLEY-KOETT MFG. CO., Covington, Ky. Booth 314.—This company will exhibit X-ray apparatus for fluoroscopic and radiographic study of metal; also assortment of films showing results of radiographic tests. In charge of the exhibit will be W. S. Werner, Dr. Hahn and H. C. Steadman.

KEMP, C. M., MFG. CO., Baltimore. Gas Section.—Operating exhibit of improved system for industrial utilization of natural or artificial gas, and burner equipment adaptable to industrial process supplied by this system. Representing the company will be W. M. Ponder, R. S. Van Note, W. S. Bassett, F. H. Andrews, William Hunt and E. B. Dunkak.

KENWORTHY, CHARLES F., INC., Waterbury, Conn. Booth 327.—This company will show photographs of various installations and samples of annealed products. In attendance will be C. F. Kenworthy, H. A. Kenworthy, R. E. Worthington and R. N. Griswold.

KEYSTONE LUBRICATING CO., Philadelphia. Booth 3.—Operating exhibit will include a safety lubricating system with pneumalectric lubricating unit. Attending will be G. W. Hall, Philip King, Vic Berguson, R. C. McDaniel and M. C. Schwenk.

L

LAKESIDE STEEL IMPROVEMENT CO., Cleveland. Booth 6.—Exhibiting photomicrographs and fractures of various grades of steel treated and untreated; a collection of heat treated parts, such as motor blocks, drive shafts, axle shafts, connecting rods, pistons, skid chains, bolts and nuts and various automotive parts, besides a collection of airplane parts. Airplane parts will include connecting rods, airplane struts, boomracks, ratchets, clevises, and turn buckles. Attending will be C. W. Derhammer, R. T. Morrow, R. L. Rolf and John Hume Jr.

LAVA CRUCIBLE CO. OF PITTSBURGH, Pittsburgh. Booth 60.—This company will exhibit a full line of various types of super-refractories in standard brick, standard tile, special shapes, plastics, cements and graphite crucibles. Representing the company will be Furman South Jr., H. E. White, D. E. MacLean, R. P. South and C. H. Knappenberger.

LAVINO, E. J., & CO., Philadelphia. Booths 349, 350.—Exhibit will include many varieties and grades of chrome ores from all parts of the world, in the crude and ground form; chrome, magnesite, and silica brick; multibond refractory cement, and plastic chrome. Photographs and drawings will illustrate installations using these materials. Attending will be R. E. Griffith, A. DeMacedo, J. B. Luckie, R. C. Hanson, W. C. Holzworth, H. W. Pigott and P. S. Haserodt.

LEBANON STEEL FOUNDRY, Lebanon, Pa. Booths 89, 91.—This company will exhibit electric steel castings.

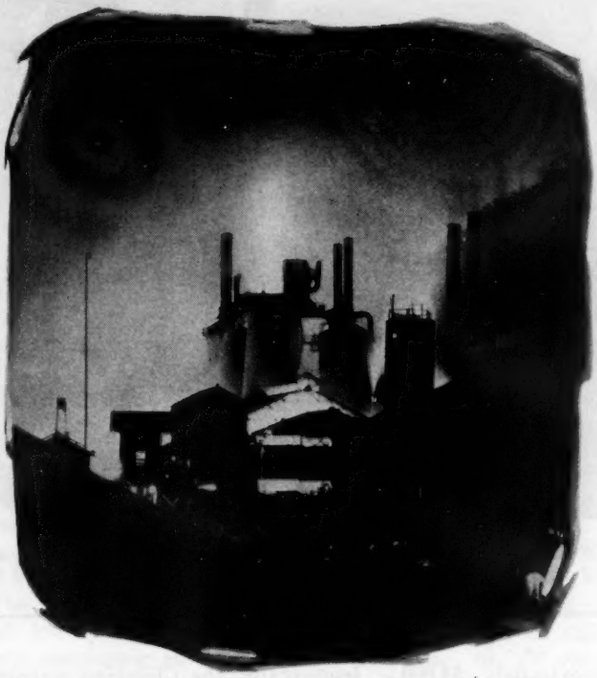
LEEDS & NORTHRUP CO., Philadelphia. Booths 353, 375.—Included in this company's operating exhibit will be automatic temperature controllers, pyrometers, temperature recorders, temperature indicators, portable precision potentiometers, portable temperature indicators,

(*Concluded on Page* 575)

Convention Daily Will Appear Fifth Time

FOR the fifth consecutive year, the Penton Publishing Co. will issue a special STEEL TREATERS' DAILY *during the National Metal congress. This daily newspaper, sponsored by* IRON TRADE REVIEW *and* DAILY METAL TRADE, *will appear on Tuesday, Wednesday, Thursday and Friday mornings. Each issue will contain complete programs and reports of convention sessions, descriptions of the National Metal exposition, and biographical sketches of prominent members of the American Society for Steel Treating, American Welding society, the Institute of Metals and Iron and Steel divisions of the American Institute of Mining and Metallurgical Engineers and the Iron and Steel division of the American Society of Mechanical Engineers. A wealth of news of general interest also will be presented. Complimentary distribution of copies of* STEEL TREATERS' DAILY *will be made at the Public Auditorium, Hotel Cleveland, Hotel Statler and Hotel Hollenden. In addition, arrangements have been completed to mail copies for all four days to all members of the American Society for Steel Treating, thus carrying to those absent all the news of the congress while it is still news. Extra copies may be obtained at the headquarters of* IRON TRADE REVIEW *and* DAILY METAL TRADE *at Booth* 308.

Scope of Steel Technology Exemplified in Industrial Cleveland

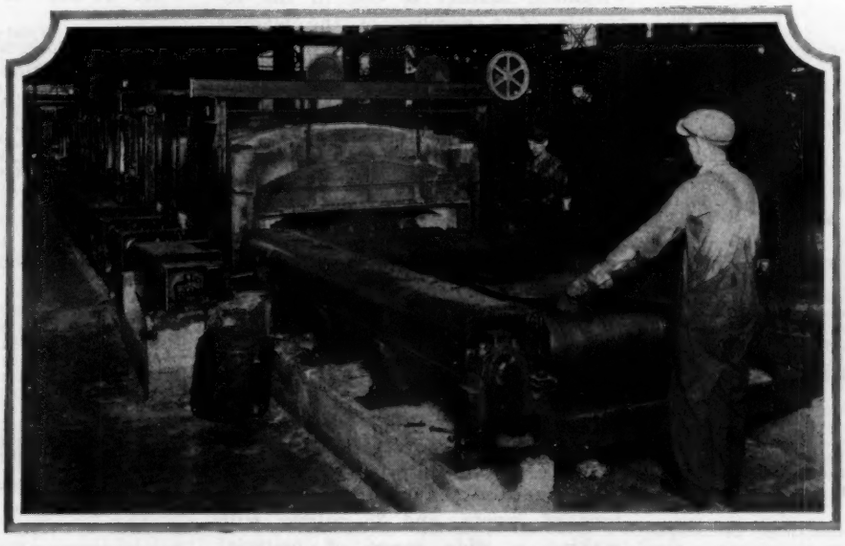


Cleveland blast furnaces have annual capacity for making 2,300,000 tons of pig iron

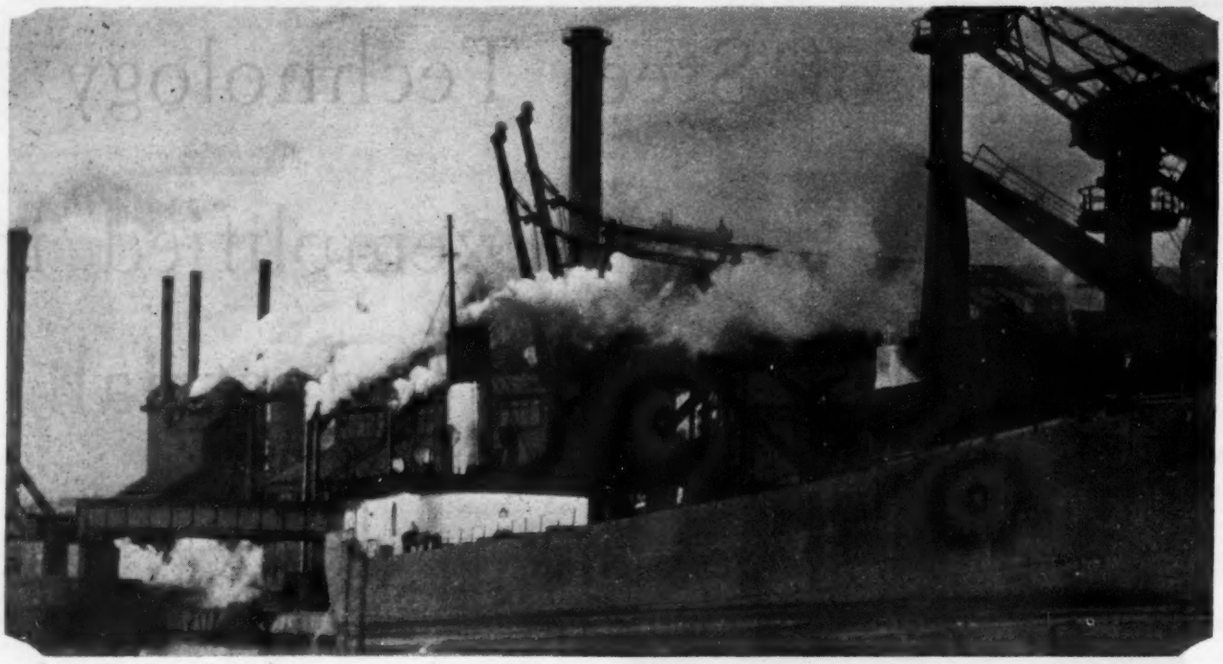
Manufacture of Metal Products Predominates—The "Great Meeting Place" of Raw Materials

CLEVELAND is in the center of the nation's iron and steel industry, and holds much of special interest to the many delegates who will attend the National Metal congress, the eleventh annual convention of the American Society for Steel Treating, and the National Metal Exposition, Sept. 9-13. Iron and steel manufacture forms the fundamental framework of industrial Cleveland, and its many ramifications lead inevitably to the specialization in which the steel treaters are most concerned. Here are made innumerable steel products marketed throughout the United States and exported to the farthest corners of the world, which depend for their success on the knowledge and skill of the metallurgists of the type who will compose the National Metal congress. Many years ago and frequently since, IRON TRADE REVIEW pointed out Cleveland's importance as "the hub of the iron and steel industry." The flow of iron ore from the Lake Superior region to Lake Erie furnaces and on beyond the Youngstown and adjacent territory, and the passage of coal and coke from the various mining district in transit to the Northwest marked this spot as the crossroads of commerce in iron and steel. Cleveland often has been referred to as the center of "the Ruhr of America," and when one contemplates its vast traffic in raw materials, the wealth and importance of its manufactures, and the consumption of iron and steel within Cleveland and nearby territory, the comparison appears appropriate as well as picturesque.

Cleveland's rise to fame began with the interest taken by some of its pioneer families in Lake Superior iron ore development, 1000 miles away. The names associated with such companies as Pickands, Mather & Co., Cleveland Cliffs Iron Co., M. A. Hanna Co. and others now identified with the United States Steel Corp., extend back to the beginning of the ore industry. Three-quarters of a century ago the first shipment of ore was brought down the lakes in barrels aboard a sail boat. Today Cleveland is the largest receiving port on the Great Lakes for Lake Superior iron ore, an average season's receipts here exceeding 9,000,000 tons.



Continuous sheet normalizing furnace in a Cleveland mill



Iron ore is brought direct to river front blast furnaces in Cleveland. One-third of the ore received at the port is consumed there

One-third of the tonnage is intercepted and consumed in the blast furnaces in Cleveland, while the remainder moves on to Youngstown, Pittsburgh and nearby steel towns. Of the total shipments of iron ore by vessel from the Northwest in a season's time, amounting to approximately 54,000,000 tons, the receipts in the Cleveland district including Ashtabula, Conneaut, Fairport and Lorain comprise nearly 45 per cent.

Cleveland also is the center of the shipping interests most concerned with the movement of iron ore from the head of the lakes to the lower lakes consuming district. There are now on the Great Lakes 338 all-American ore and coal carriers, and of these 311 are controlled from Cleveland. Here are the headquarters of the Pittsburgh Steamship Co., the vessel subsidiary of the United States Steel Corp., with 87 boats, and of the Interlake Steamship Co., operated by Pickands, Mather & Co., in the interests of a number of the leading independent iron and steel companies, with 45 units of the great fleet. There are six iron ore unloading docks in Cleveland, two of these being controlled by railroads exclusively for shipment to interior furnaces.

Center of Intense Production

Cleveland is the pivotal point of a closely knit district, whose production of iron and steel is exceeded only by the Pittsburgh, Youngstown and Chicago territories. In the Cleveland district there are a score of blast furnaces, with annual production capacity of more than 3,500,000 tons of pig iron, 15 steelworks with an annual capacity of more than 5,000,000 tons of ingots, and 35 rolling mills making a wide range of material. Incidentally, the Cleveland district accounts for 8.3 per cent of the nation's total steel ingot capacity, and about 8 per cent of its pig iron capacity.

But this is a story of Cleveland itself, and here there are 11 blast furnaces, with an annual capacity of 2,300,000 tons of pig iron, and four steel companies with capacity for producing 2,631,000 tons of ingots anually. In steel, the McKinney Steel Co. leads the list with capacity for

Cleveland's Iron and Steel Plants, Rolling Mills

BLAST FURNACES

	Stacks	Annual pig iron capacity
American Steel & Wire Co....	4	770,000
McKinney Steel Co.	4	1,000,000
Otis Steel Co.	2	400,000
Bourne-Fuller Co.	1	130,000
Total	11	2,300,000

STEEL PLANTS

	Annual ingot capacity
McKinney Steel Co.	1,000,000
American Steel & Wire Co.....	970,000
Otis Steel Co.	421,000
Bourne-Fuller Co.	240,000
Total	2,631,000

ROLLING MILLS

American Sheet & Tin plate Co., Crescent works, black sheets and tin plate.

American Steel & Wire Co., five plants, including American, Consolidated, Cuyahoga, H. P., Newburgh works, wire and wire products.

Cleveland Hardware Co., two plants, bars.

Empire Steel Corp., sheets.

Lake Erie Bolt & Nut Co., bars.

McKinney Steel Co., billets, sheet bars, slabs and bars.

Otis Steel Co., two plants; Lakeside works, plates; Riverside works, sheets.

Republic Iron & Steel Co., Steel & Tubes Inc., works, electrically welded tubing.

Bourne-Fuller Co., Upson Nut works, bars; Union mills, merchant bars and shapes, bolt, nut and rivet rods.

Cleveland District Leads in Iron Ore Receipts

Year	Total receipts lower lake ports Gross Tons	Received at port of Cleveland Gross Tons
1920	57,941,954	7,857,163
1921	22,077,719	2,565,902
1922	42,187,097	7,175,070
1923	58,446,337	8,982,957
1924	42,197,336	6,556,372
1925	53,540,485	8,376,662
1926	57,952,476	9,615,812
1927	50,596,065	8,295,971
1928	53,441,065	9,375,764

	Received in Cleveland district* Gross tons	Per Cent of total	All other ports Per cent of total
1920	30,153,979	52.04	47.96
1921	13,018,784	59.00	41.00
1922	25,289,533	59.95	40.05
1923	34,148,443	58.43	41.57
1924	25,538,768	60.52	39.48
1925	31,433,703	58.71	41.29
1926	34,248,367	59.09	40.91
1927	29,002,073	57.32	42.68
1928	29,451,482	55.11	44.89

*Includes Cleveland, Ashtabula, Conneaut, Fairport and Lorain.

1,000,000 tons of ingots; the American Steel & Wire Co. is a close second with 970,000 tons; Otis Steel Co., with 421,000 tons, and Bourne-Fuller Co., with 240,000 tons. The McKinney company also has the lead in pig iron producing capacity, its four blast furnaces being rated with a total of 1,000,000 tons annually. American Steel & Wire Co. has capacity for 770,000 tons of pig iron; Otis company 400,000 tons, and Bourne-Fuller 130,000 tons. These companies have extensive finishing mills, as do others as set forth in an accompanying list, and all of them maintain laboratories of special interest to the steel treaters and others attending the National Metal congress.

Manufactures Are Diversified

While the foregoing sums up briefly the interests identified with the primary iron and steel manufacture, Cleveland is noted for the diversity of its manufactures, depending on these metals. The United States census sets up 280 classes of industry, and 218 of these are in Cleveland.

The latest census data show Cleveland has 2289 industrial establishments, employing an average total of 135,187 workers, who receive an annual payroll of $206,306,000, and who produce materials valued at $1,068,000,000. It will be noted in the subjoined list of manufacturers that are directly related to iron and steel production or manufacture there are 613 establishments, of the total of 2289. And the value of the annual output of these 613 establishments is $510,859,687, compared with $538,756,687 for all of the remaining 1641.

The value of products of the iron and steel plants and rolling mills is approximately $100,000,000 annually. This city is the second largest foundry center in continental America, next after Chicago, and has 121 iron and steel and nonferrous castings plants. The value of their annual output is close to $75,000,000. Another evidence of the consumption of iron and steel is the value of motor vehicles and parts, made here, exceeding $155,000,000 annually.

Automatic Interests Numerous

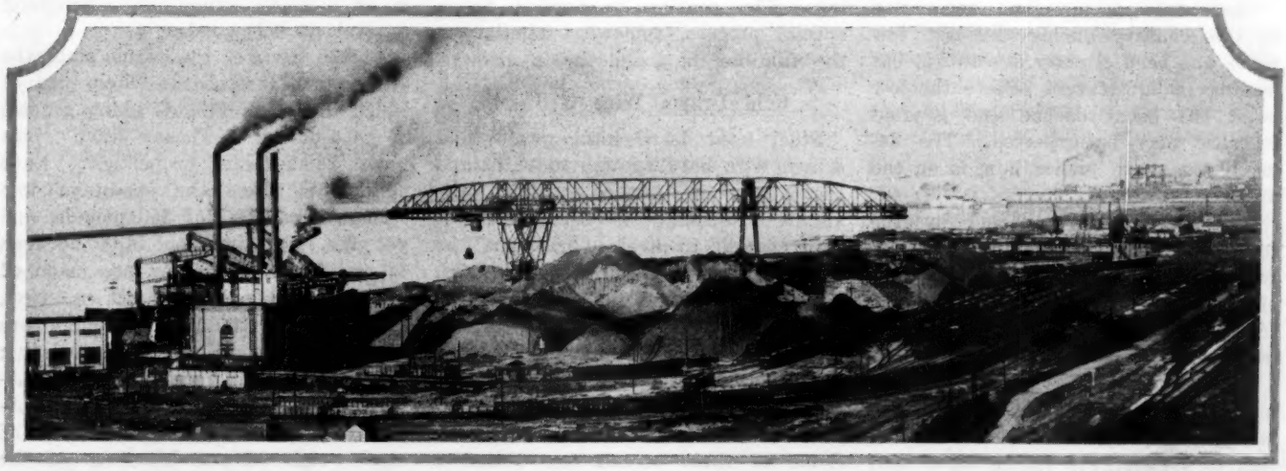
Cleveland is in the front rank as a producer of motor cylinders, automobile springs, tubing and rims, and makes a vast number of other automobile parts such as crank shafts, motors, carburetors, bodies, bearings, axles, frames, forgings and wheels.

The city leads in the production of automobile parts and accessories many of which require special heat treatment, a fact of interest to the delegates to the National Metal congress. More springs, are made here for wagons, carriages and automobiles than anywhere else. One company alone makes more than 7000 a day.

Cleveland is one of the largest general hardware producing centers in the United States. There are several large manufacturers of steel office furniture, printing presses and paper cutters. In the production of wire nails, bolts and screws, malleable castings and heavy machinery Cleveland practically leads the world. It holds high rank in the production of tacks, drills, steam hammers, lathes, punches, shears, forges and automatic screw machines. Other products turned out in great quantity include wire springs, wire fence; tools of all kinds, hoisting and conveying machinery, railroad supplies and stoves.

Cleveland Industries Allied with Iron and Steel

	Number of establishments	Value of annual output
Bolts, nuts, washers, rivets, not made in rolling mills	12	$ 20,758,273
Brass, bronze and other nonferrous alloys and manufactures	31	7,512,563
Car and general construction and repairs, steam railroad repair shops	10	13,197,396
Copper, tin and sheet iron work, including galvanized iron work	26	2,468,119
Electrical machinery, apparatus and supplies	72	59,987,074
Forgings, iron and steel, not made in steelworks or rolling mills	14	11,879,397
Foundry and machine shop products	175	72,299,905
Foundry supplies	8	2,275,019
Galvanizing and other coating, not done in rolling mills	5	260,725
Hardware	6	3,181,259
Iron and steel, blast furnaces	4	32,623,333
Iron and steel, processed	4	171,461
Iron and steel, steelworks and rolling mills	16	98,066,247
Machine tools	23	15,307,787
Motor vehicle bodies and motor vehicle parts	46	77,434,520
Motor vehicles, not including motorcycles	8	77,587,675
Screw machine products	14	8,799,498
Ship building, steel and wooden, including repair work	5	1,796,171
Stamped and enameled ware	19	6,781,636
Steam fittings, and steam and hot water heating apparatus	10	4,836,086
Steel barrels, kegs and drums	7	5,158,406
Stoves and ranges, other than electric, and warm air furnaces	26	23,196,055
Structural and ornamental iron and steel work, not made in rolling mills	27	12,240,524
Tin cans and other tinware	3	3,751,804
Tools, not including edge tools, machine tools, files or saws	26	9,898,123
Wirework	16	10,390,631
Total	613	$510,859,687
All other industries	1,641	538,756,687



Cleveland and Pittsburgh ore dock, lake front, Cleveland, operated for the Pennsylvania railroad. Delegates to the National Metal congress will inspect this dock

Large Uses of Steel

148th Article
Pianos

ELEVEN pounds of steel tuning pins are used in each of the country's annual output of 300,000 pianos.

in Small Ways

THE foreman of a large piano factory collected all the parts made of steel which enter into the construction of an average size grand piano, and to his surprise he found that the weight of these parts exceeded 28 pounds. The amount of steel required for an upright piano is less, and it is estimated the average for all pianos is about 20 pounds. Government statistics place the annual production of all types of pianos in this country at close to 300,000 for which number 3000 tons of steel would be required on the basis of 20 pounds each.

The tendency in piano production in this country during the last few years has been slightly downward, but leading manufacturers believe the low point has been reached and gradual increase may be expected. The demand for grand pianos now is on the upgrade.

The steel parts collected by the foreman did not include the nails and screws used in the frame and case of the piano, but did include the heavy screws used to hold the piano plate in place.

The collection of parts included many varieties of steel, from the heavy stampings in castor construction to the delicate spring steel used in some of the action parts. The piano tuning pins usually are in three sizes, No. O which are 0.275-inch diameter; No. OO, 0.280-inch diameter and No. OOO, 0.285-inch diameter. These pins range from 2 to 2½ inches in length, the average being about 2⅜ inches. The pins are round nosed at the lower end, have a peculiar shallow thread on the shank, and are squared at the upper end to take a wrench. In addition, they have a small hole drilled in the head through which the wire is threaded. The formed pin is tumbled in a dry barrel to smooth down all edges, and is then cleaned and prepared for the corrosion resisting coating. The coating is applied by a special process, somewhat similar to the familiar japanned finish.

Cold Drawn Wire Is Used

Steel used is a high grade cold drawn wire hard enough to withstand the strain in service without the slightest tendency to bend, and yet soft enough to avoid "brilliance" or metallic tone conveyed to the strings. All standard pianos have 250 of these tuning pins, weighing on an average a total of 11 pounds.

The other steel items in a standard grand piano include 110 screws used to hold the plate to the frame. Some of these screws are 6 and 7 inches long and their importance may be judged from the fact that the total strain on a piano plate runs close to 30 tons. All the screws used in piano construction with the exception of those in the case and frame weigh 7 pounds. The steel strings, including the steel centers of the bronze bound bass strings, weigh 4 pounds. The castors weigh 2½ pounds.

Bridge pins are small steel wire pins pointed at one end and in general resembling large phonograph needles. These pins tie the strings firmly to the bridge and constitute the point at which the string vibration starts. There are 500 of them in an ordinary grand piano weighing a total of 0.6-pound.

At the back of the piano plate the strings are fastened to hitch pins of which there are 175, weighing a total of 0.4-pound. These hitch pins have remarkable properties. Each single pin takes the strain of two strings or a total of 350 pounds, and yet the pin diameter falls between ⅛ and 3/16-inch. They are made of high carbon specially drawn steel, and like the tuning pins many are imported from Europe. Regulating and other small screws weigh 0.5-pound. Pedal springs also weigh 0.5-pound and action springs and pins of steel weigh 0.2-pound. Some of the action springs are of brass. The steel springs are of wire, nickel plated.

Cutting Tools Improved by Control of Furnace Atmosphere

Removing of Combustion Products from Heating Chamber Is Found To Be Conducive To Better Results in Hardening

By J. H. G. Williams

Metallurgical Engineer, Henry Souther Engineering Co.

CONTROL of atmosphere in the heating chamber of furnaces for hardening metal cutting tools is coming more and more to be regarded as a major factor in the uniformity and quality of the product. As a result, engineers are laying less stress on the time and temperature items and are directing attention to furnace design, particularly the use of gas curtains, muffles and the injection of raw gas for combustion. In the accompanying article, J. H. G. Williams, metallurgical engineer, Henry Souther Engineering Co., Hartford, Conn., points out why the control of furnace atmosphere is important and how close attention to this detail will result in more uniform results in the product. Those engaged in tool hardening will find much of interest in the conclusions which Mr. Williams has reached after a comprehensive study of furnaces of various types.

MANUFACTURERS and users of small tools long have observed that metal-cutting tools exactly alike in size, composition, and structure, exhibit widely varying productive abilities. Absolutely identical in a mechanical and metallurgical sense, within the limits of human endeavor, individual tools from a batch will not show identical behavior on identical jobs. There will be the best tool, the poorest tool, and the average good tool, with a spread in results that is disturbingly wide. Explanations of this peculiarity dwell upon nonhomogeneity, ingot locations, nonmetallic inclusions, occluded gases and that alibi, the human equation.

Because of the close control exercised upon time and temperature factors, we are prone to overlook the heat treating operation as a cause of nonuniformity. However, the life of a tool per grind invariably is determined by the condition of the cutting edge. This portion of the tool, thin and exposed, is susceptible to the action of furnace gases, which are changeable, inconstant, and full of eddy currents, and may, therefore, be modified sufficiently in metallurgical structure to account for the variation in life between individual tools.

Substitute Liquid for Gas

Recognizing the possibility of injury, but not of improvement, to the cutting edge by the action of the furnace gases, manufacturers usually eliminate the gaseous atmosphere entirely by employing liquid bath furnaces whenever the temperature range permits. It does not follow because the bath in which the tool is immersed is liquid instead of gaseous, that influences affecting the surface of the steel thereby are avoided. Lead baths become contaminated with minute quantities of various impurities, such as metallic oxides, sulphur, and dirt, all held in entrainment. Misbehavior of lead baths is a common experience. Discolorations, pitting, and local variations in hardness frequently are encountered. The same hold true for salt baths. In the course of time they become foul and contaminated.

Heretofore, time and temperature have been regarded as the chief factors in tool hardening. The present trend in furnace design includes gas curtains, and the injection of raw gas into the heating chamber, thus indicating that the question of furnace atmospheres is receiving more study and attention. Of the fuel used for heating, only gas and oil ordinarily are found in heat treating departments. They generate heat by means of combustion, that is, by the chemical union of their combustible elements with oxygen. Only three combustible substances are present in these fuels; namely, carbon, hydrogen, and sulphur. These elements are present in various combinations, and the sulphur in small quantities, if at all. Air is the source of oxygen.

Carbon Dioxide Is Formed

Products resulting from the combustion of carbon and hydrogen, regardless of the form in which they exist, is carbon dioxide and water vapor. Since the air contains a preponderant amount of nitrogen, the heating chamber if containing the products of combustion, is composed of carbon dioxide, water vapor, and nitrogen, with possibly a small quantity of sulphur as an oxide.

At the elevated temperatures carbon dioxide decarburizes steel, that is, removes carbon from it; water gas or vapor oxidizes or scales the steel; while nitrogen tends to embrittle it. The effect of gaseous sulphur compounds is not definitely known, although it is suspected of being detrimental in nature. Naturally these gases act upon the surface of the tool.

To overcome any injurious effect caused thereby, tools are provided with an allowance for grinding, the theory being that if ground after hardening, the decarburized or otherwise affected zones will be removed. Should the injurious effects extend deeper than the grinding allowance, then the cutting edge will be more

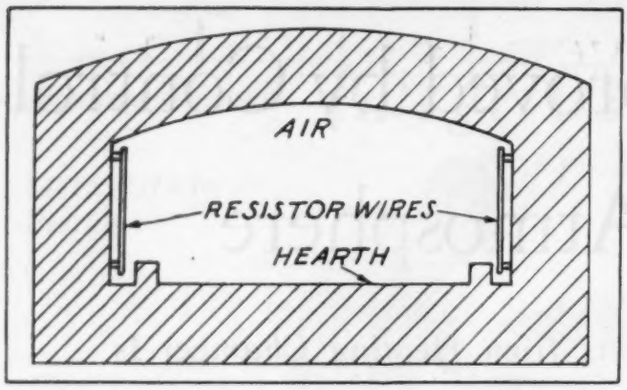


Fig. 1—Diagram of electric resistance furnace, which, due to absence of combustion gases, is virtually of the muffle type

or less impaired and the top rendered less efficient.

However, the atmosphere described presupposes the condition of perfect combustion, which rarely exists. For instance, oil fuel requires an excess of air when developing its maximum practical heating value. With surplus air the furnace atmosphere in addition to other gases contains free oxygen, which scales steel rapidly and deeply. Practical heat treaters offset this tendency by reducing the air supply, thereby leaving unburned oil gas in the heating chamber, and, incidentally, decreasing the fuel economy. The resulting atmosphere is a mixture of carbon dioxide (decarburizing), carbon monoxide (carburizing), hydrogen (decarburizing), hydrocarbons (carburizing), water gas or vapor (oxidizing), free oxygen (oxidizing), and nitrogen (embrittling). A medley of this nature is not conducive to control, and, as a further complication, the turbulence within the furnace swirls unmixed gases helter skelter through the heating chamber subjecting the surface of the tools to chemical attacks, good, bad, and neutral.

A similar condition develops when manufactured, city or illuminating gas, as it is variously called, is used as fuel. Such gas lends itself readily to premixture with air in the correct proportions for perfect combustion. As mentioned earlier, the products of perfect combustion are decarburizing and embrittling as well as oxidizing. Alteration of the premixing condition to obtain a slight excess of gas results in the loss of control through the introduction of unknown quantities of free hydrogen, hydrocarbons, and the formation of cyanides. Turbulence of the gas currents within the heating chamber will render the heating atmosphere ever-changing, beneficial, detrimental, neutral.

Muffles Prove Effective

It would appear then, that the removal of the products of combustion from the heating chamber would promote a condition more susceptible of control. In the fuel-fired furnace this is brought about through the use of muffles as shown in the furnace diagram at right in Fig. 2. Contrivances of this kind enable the heating to take place in an atmosphere of hot air. Consisting of oxygen and nitrogen, the one oxidizing, and the other more or less embrittling, air is by no means an ideal heating medium; it serves as a starting point merely because of the constancy of its composition. Various ideas have been applied to modify the composition and neutralize the undesirable conditions. Generally speaking they depend upon changing the oxygen to carbon monoxide by means of charcoal or other form of carbonaceous material.

Charcoal and oxygen combine, to be sure, but form carbon dioxide as well as carbon monoxide. In practical applications the result is usually decarburizing.

To render a mixture of carbon dioxide and carbon monoxide neutral to steel, the two gases must be in chemical equilibrium with the carbon content of the steel at the temperature and pressure prevailing within the muffle, and with the iron, as regards its affinity for oxygen. Such a condition may be brought about by the presence of free carbon, charcoal, for instance, within the chamber through which the gas mixture is flowing. However, should the muffle or chamber be opened, air is admitted and the balance is at once destroyed.

Electric resistance furnaces, as shown in Fig. 1, are virtually muffle type, in that the atmosphere within the heating chamber consists of heated air, and hence, in this respect, are no better than fuel-fired muffle furnaces. Injections of raw gas are sometimes used to neutralize the oxidizing influences. City gas, as made in different communities, is of widely varying composition. The carbon monoxide content may run as high as 36 per cent, or as low as 3.5 per cent; in fact, the carbon carrying gases in total may range from 61.8 per cent in one city, to 39.6 per cent in another. The point is that a device ad-

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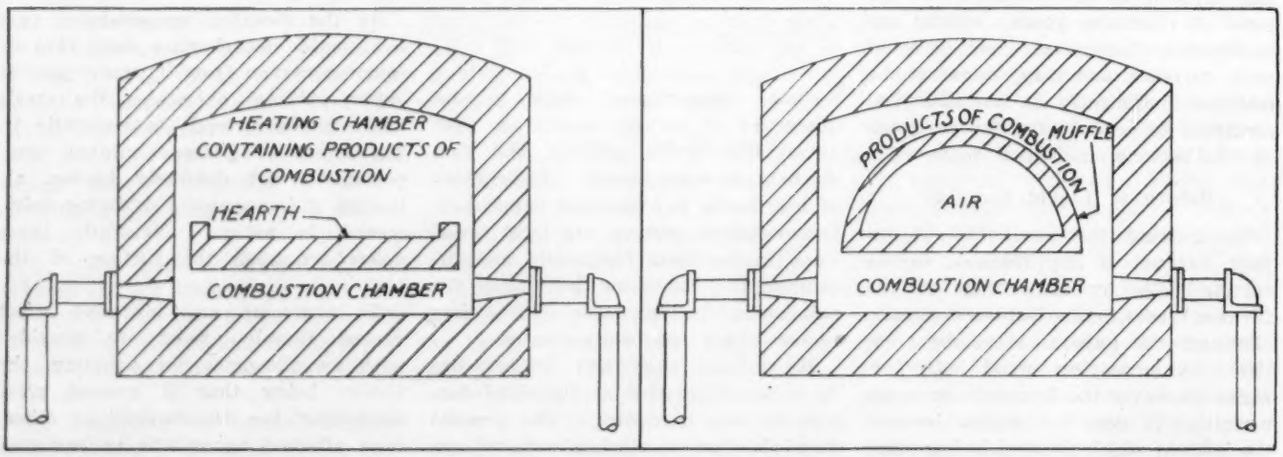
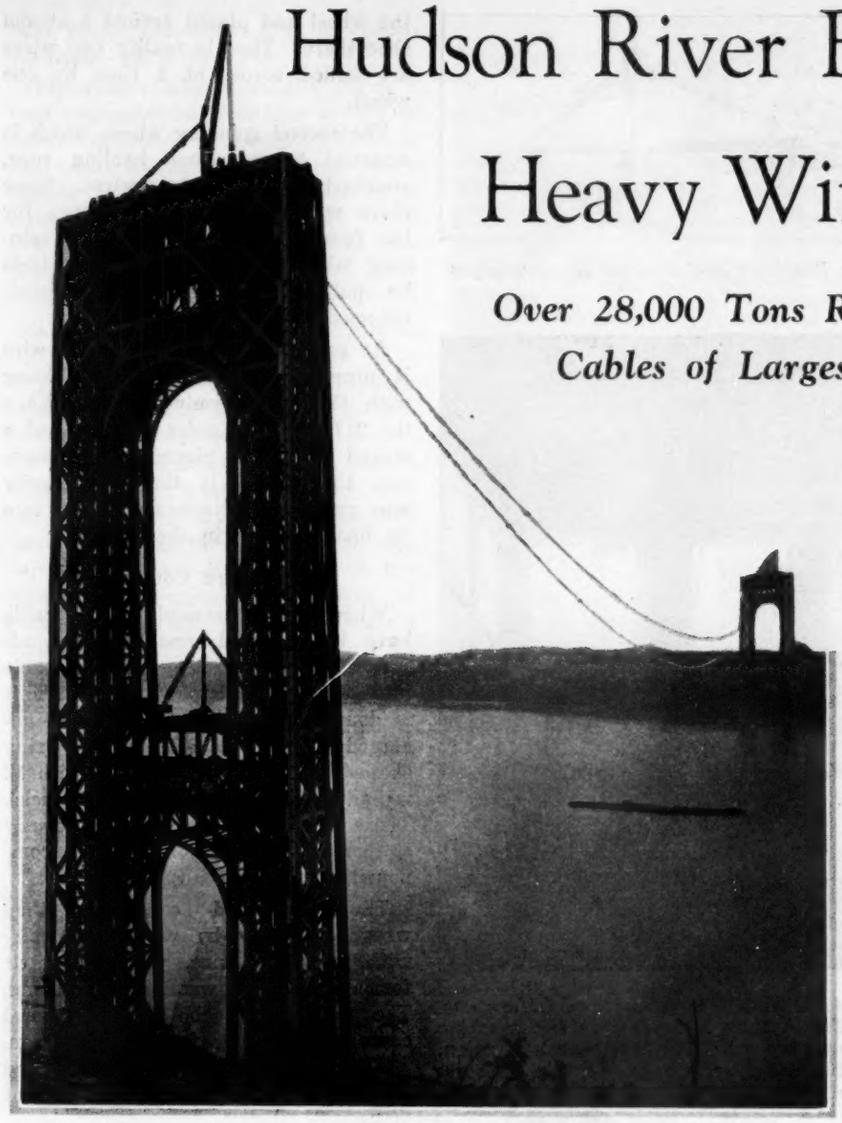


Fig. 2—Tools undergoing heat treatment in furnace of design shown at left are unprotected from products of combustion and consequently are subjected to a variety of chemical attacks, favorable, unfavorable and neutral. Use of muffles, as shown in furnace at right, removes products of combustion from heating chamber and facilitates atmospheric control

Hudson River Bridge Takes Heavy Wire Tonnage

Over 28,000 Tons Required for Four Main Cables of Largest Suspension Bridge



A late view of the partially finished Hudson river bridge

Steelwork in towers, 40,200 *tons.*

Total structural steel in main bridge without lower deck, 73,000 *tons.*

Weight of cable wire, 28,450 *tons.*

Length of main span, 3500 *feet.*

Length between anchorages for cable, 4760 *feet.*

Length of bridge and approaches, 8800 *feet.*

Width of main structure, 120 *feet.*

Height of towers above water, 635 *feet.*

Four cables, each 36 *inches in diameter.*

Wires in each cable, 26,474.

Diameter of each wire, 0.195 *inch.*

Minimum specified strength of wire, 220,000 *pounds per square inch.*

WORK practically is completed on the erection of footbridges from which the four suspension cables will be spun for the new Hudson river bridge between Fort Washington, N. Y., and Fort Lee, N. J. The completed structure will cost, it is estimated, over $60,000,000, and over 28,000 tons of wire will be required.

Each cable will be 36 inches in diameter, and will include 61 strands of 434 wires, or a total of 26,474 wires. The wire will be cold drawn and will include approximately 107,000 miles of material. Combined strength of all the wires in the cable will be close to 200,000,000 pounds.

The individual wires, 0.196 inch in diameter, will sustain a load of 7600 pounds before breaking, or a strength of 230,000 pounds per square inch of sectional area. This is four times the strength of steel ordinarily used in building construction. The combined tractive force of 2000 freight locomotives would be needed to break one of these cables, engineers claim. The cable will, however, under the most severe loading conditions, be subjected to a stress of only one-third the cable strength. The wire is being manufactured and supplied by the John A. Roebling's Sons Co., Trenton, N. J.

Steel Is Cast Into Ingots

Open-hearth steel is used for the wire. Leaving the furnace, the metal is cast into ingots about 14 inches square and 5 feet long. After chemical analysis the ingots are reheated and passed through rolls which reduce them in sections to about 4 inches square and increase their length to about 60 feet, forming blooms. These blooms then are cut into billets about 8 feet long. The billets, after being reheated, are rolled into rods about ⅝-inch in diamter, which are coiled and tempered.

The rods are cold drawn to the ultimate size of the wire, about 5/16-inch diameter. Nearly 4000 lineal feet of wire are drawn from each billet. The wire is galvanized to protect it against corrosion. Each wire is tested for strength and other properties, and stored in coils. Before shipment to the bridge site the individual pieces of wire are spliced with sleeve couplings and wound up on reels 6 feet in diameter, each reel holding about 8 tons or 30 miles of wire. The reels are transported to the bridge site as needed.

Before the actual spinning of the cables can be started, a considerable amount of preliminary work was necessitated at the bridge site. This consisted principally in building the working scaffolds or footbridges. These footbridges, one for each pair of cables, were built as nearly as possible in a position slightly lower than the position for the cables and parallel thereto.

Each footbridge is supported by two

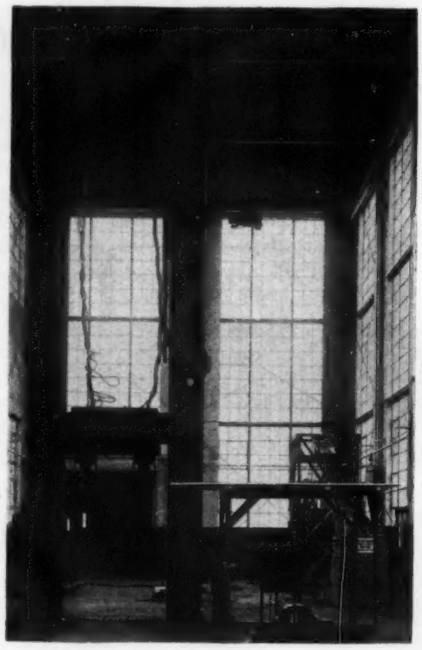
Sketch showing comparative sizes of the Brooklyn and Hudson River bridges

groups of 9 twisted wire ropes of about 3-inch diameter. These ropes were stretched across the river from anchorage to anchorage, by mounting the reels on a barge, towing the barge across the river, and allowing the ropes to unreel and fall to the bottom of the river. The ropes then were hoisted to the tops of the towers, and properly adjusted. The footbridge platform, consisting of a light steel frame with wooden planking, was laid across these temporary cables. After their use for supporting the footbridges, these ropes will be cut up into shorter lengths and made into the permanent suspenders from which the floor of the bridge eventually will be hung.

Tramway Ropes Hung

Over each footwalk are erected two so-called hauling or tramway ropes, one for each cable. Each of these ropes is endless, passing from one anchorage across the river to the opposite anchorage, around a pulley or sheave and back. These endless ropes are supported about 15 feet above the footwalks by overhead frames, placed at each tower and at intervals along the footbridges. At the New Jersey anchorage, each tramway rope passes around a drum which is driven in either direction by an electric motor. At two points on each of the tramway ropes a traveling or spinning wheel is attached. The points where these wheels are attached are so fixed that when one wheel is at the near achorage, the other wheel is at the far anchorage.

Each cable strand is spun independently in a temporary position outside the main cable, but parallel to it. In spinning a wire from a reel located at an anchorage, it is made to unwind and its free end is fastened temporarily at a point near the strand shoe. The loop of wire thus formed between this fixed end and the unwinding reel is placed over the spinning wheel. The spinning wheel is propelled across the river by a hauling rope, unwinding the wire from the reel by progressively lengthening the loop. When the spinning wheel has reached the other anchorage, the wire loop is removed from the wheel and placed around a strand shoe there. Thus in reality two wires are pulled across at a time by one wheel.



All bridge ropes are tested before use. The broken test piece in the machine snapped at 1,300,000 *pounds tension,* 100,000 *pounds over the minimum required strength*

The second spinning wheel, which is attached to the same hauling rope, similiarly pulls out two wires. Since there will be four hauling ropes for the four cables, each with two spinning wheels, 16 wires may at times be pulled across the river simultaneously.

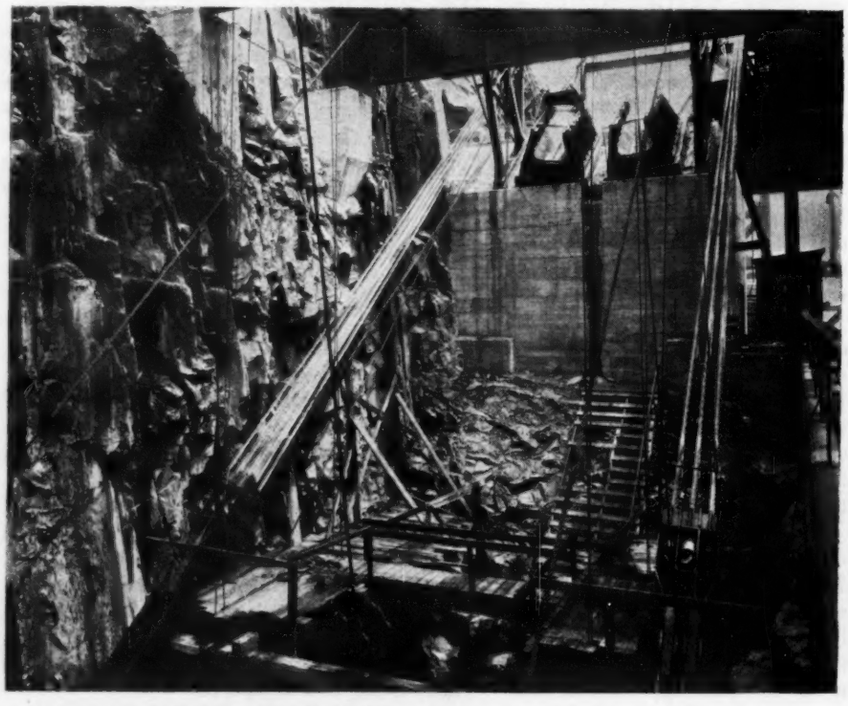
As soon as pulled across, each wire is properly adjusted so as to hang with the predetermined sag. When the 217 loops, or pairs of wires, of a strand have been placed in this manner, the strand is tied temporarily into cylindrical shape and lifted into its final position in the cable.

Strands Are Compacted

When all 61 strands of a cable have been placed, and properly adjusted, the compacting of the cable into cylindrical shape is begun. This is done by a number of specially designed squeezers. They are ring shaped frames, each equipped with 12 radially mounted hydraulic jacks. These jacks press simultaneously against the cable surface with a compound pressure of about 400 tons.

The compacted cable is then wrapped tightly by winding spirally with wrapping wire, which in itself forms an almost watertight covering. The cables will be given several coats of paint for further protection.

The spinning operation is scheduled to be completed the latter part of

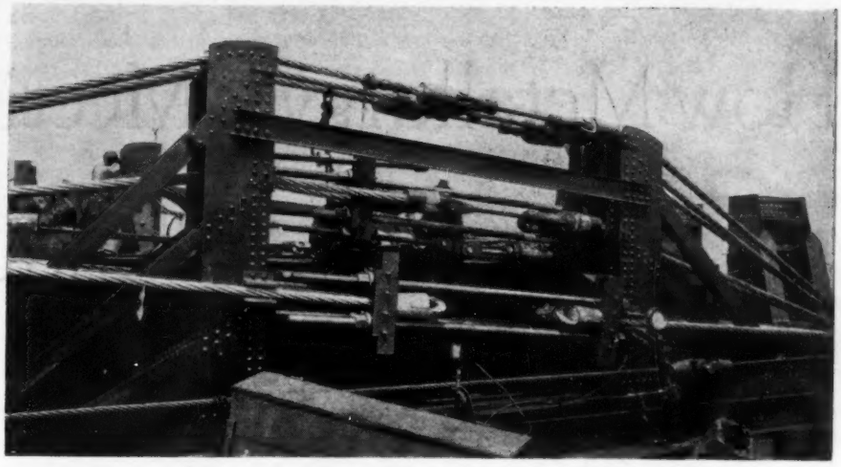


Partially completed anchorage in solid rock, on the New Jersey side

next year. The bridge is to be opened to traffic early in 1932.

The cables will eventually carry a load suspended between the towers of about 180,000,000 pounds. This is equivalent to the weight of ten heavy freight trains, each two-thirds of a mile long, and equal to eight times the corresponding load carried by the Brooklyn bridge, across the East river, New York.

While the Brooklyn bridge carries its load with four cables, each of a diameter of 16 inches, the Hudson river bridge will have four 36-inch cables. They will pass over the towers at a height of 635 feet above water and, by means of heavy eyebar chains and anchor girders, will be anchored on the New Jersey side to the solid mass of rock, and on the New York side to a huge block of masonry covering one and one-half acres.



Structural detail of the support for footbridge cables, atop the towers

Develops Heat Resisting Alloy Material

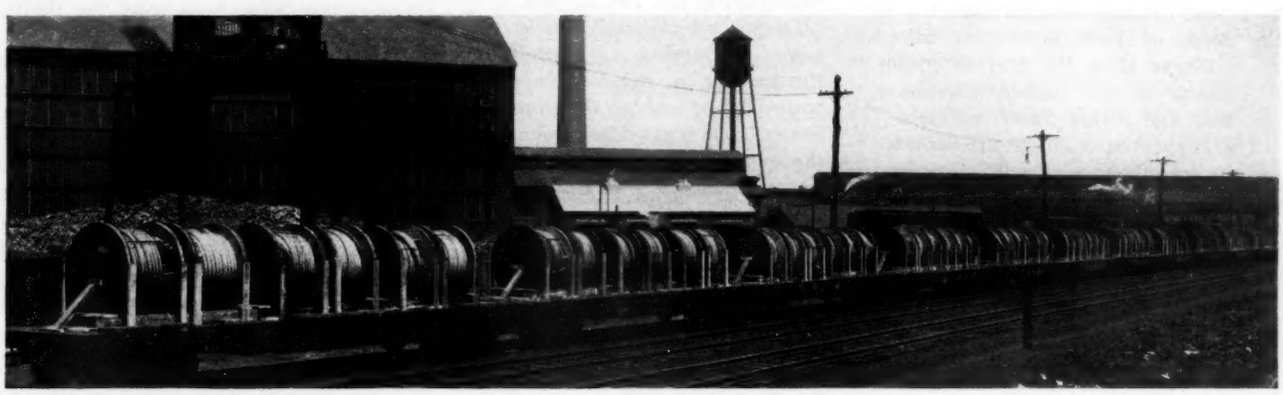
Research laboratories of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., have developed a new metal known as Konel which is credited with being considerably stronger than other metals at high temperatures. Originally developed as a substitute for platinum in the manufacture of filaments for radio tubes, the new metal was discovered to be harder to forge than steel and to be extremely tough at high temperature when most metals lose their strength. The substance is much cheaper than platinum and in filaments in which it is used will outlast the former type by a wide margin, it is claimed. Credit for the creation of the metal is due to Dr. E. F. Lowry, a graduate of Ohio State university, Columbus, O. Many new and advantageous uses for the material undoubtedly will be disclosed in the near future.

Rate Cut Is Suspended

Washington, Aug. 27—The interstate commerce commission has suspended until March 23, 1929, the operation of certain railroad schedules which propose to reduce the rates from 9½ to 8 cents per 100 pounds on iron and steel articles, in carloads, from Chicago district points to Milwaukee and contiguous points.

Comparison of Suspension Bridges

	East River			Delaware river	Hudson River		
Location	Brooklyn New York	Williamsburg New York	Manhattan New York	Delaware river Philadelphia	Bear Mountain Bear Mt. N. Y.	Mid-Hudson Poughkeepsie, N. Y.	Fort Washington 179th St., New York
Date of erection	1870-83	1896-1903	1901-10	1922-26	1923-24	1926-	1927-
Length of main span in feet	1,596	1,600	1,470	1,750	1,632	1,500	3,500
Number of cables	4	4	4	2	2	2	4
Number of strands per cable	19	37	37	61	37	19	61
Diameter of cable in inches	15½	18¾	20¾	30	18	16¾	36
Total number of parallel wires in main cables	21,432	30,784	37,888	37,332	14,504	12,160	105,896
Total weight of wire in main cables in tons	3,272	4,344	6,108	6,626	1,914	1,998	28,500
Total length of cables between anchorages in ft.	3,578.5	2,985	3,224	3,540	2,640	3,287	5,212
Total strength of main cables in tons	44,800	89,200	113,200	118,000	47,200	39,000	350,000
Diameter of individual bridge wires in inches	0.187	0.192	0.195	0.195	0.195	0.195	0.196
Height of towers in feet	273	310	291	385	350	315	635
Number and diameter in inches of suspender ropes at each panel point	1⅝ and 1¾	4-1¾	2-1¾	4-2¼	2-2¼	2-1⅞	8-2⅞



Entire shipment of land span suspender ropes, 12 carloads, six reels to the car. These ropes first support the footbridges from which the main cables are spun. All of these wires are cut to exact lengths and held under tension for 20 hours

How Metallurgy Is Meeting Demands of Chemical Industries

By B. D. Saklatwalla

Vice President, Vanadium Corp. of America

EARLY in the development of the metallurgical arts it was recognized that pure metals were not capable of fulfilling all requirements. This becomes apparent today, especially in regard to the chemical industry. The requirements of chemical corrosion combined with pressure and temperature resistance cannot be found in the pure metals. It is for this reason that in recent years unusual activity has been displayed in the development of alloys to keep pace with the chemical industry.

When chemical products were manufactured in small quantities and the units of apparatus were relatively small, the question of material for equipment was not acute. In cases of extreme corrosion metals played an insignificant part as the small units could well be constructed of stoneware, glass, porcelain and other nonmetallic materials. The rapid increase of production made the use of small units uneconomical and larger units could not well be constructed of nonmetals. The industry was then forced to call upon the metallurgist for alloys having the physical strength for large engineering structures and also possessing practically the non-corrodibility of the non-metallic materials.

The nonferrous group of alloys has been used in the chemical industry in the form of pure metals or alloys much longer than the ferrous group. It consists of the copper, aluminum, tin, lead and nickel base materials.

The copper base alloys are suitable for the manufacture of equipment and containers for handling cold and dilute solutions of sulphuric, sulphurous and hydrochloric acids, and salt solutions of such acid radicals. These alloys are also useful for the construction of equipment handling mine waters, alkaline and tanning liquors and seawater. Their usefulness, however, is limited when in the above mentioned solutions oxidizing agents are present or they are required to operate at higher temperatures under mechanical load.

Aluminum as a metal has some good properties for chemical resistance. However, concentration and temperature of the corrosive solution have a great effect on the resistive properties of aluminum; therefore great care must be exercised in ascertaining these factors for a particular operation before adopting its use. Further, the purity and thermal history of the metal has great effect. For instance, aluminum that has been previously heated to 400-500 degrees Cent. has been found to be more resistive to nitric acid and recent work of Prof. Maas has shown that the temperatures of melting, rolling and heat-treating have a decided influence on the acid-resisting properties of aluminum. Further, these properties are markedly influenced by slight amounts of impurities present in commercial grades, although such grades have been effectively used for handling certain concentrations of nitric acid at certain temperatures. With the advent of the Hoopes' process of refining aluminum, thus obtaining a metal of extraordinary purity, the future may see its wider application in fields where the presence of impurities of the present-day commercial grades has made it undesirable.

Tin has been used in the form of coating for other metals, mostly as tin plate for containers. It has been also used in the form of a heavier lining for copper vessels and tubes in the preparation of pharmaceuticals and food-stuffs. As the pure metal in the form of block tin it forms essential material in the construction of distilling apparatus.

Nickel as the metal has been widely applied in the food-stuffs industries and also in handling acetic acid in the presence of oxidizing agents. Alloys of nickel with copper and with manganese have been used for dilute sulphuric and hydrochloric acids and in contact with salt water. Alloys containing nickel are also eminently suitable for alkaline caustic and carbonate liquors and for hot or cold ammonia. Nickel-copper-chromium alloys with tungsten and molybdenum contents have been used for sulphuric and mixtures of sulphuric and nitric acids. Alloys of nickel have also been useful against chemical attack in the laundry and dairy trades.

In the class of ferrous corrosion-resisting alloys there are two subdivisions: the cast iron group and the steel group:

In the cast iron group alloyed iron

Faces Challenge of Corrosion

IF ONE could view at a single glance all of the current activities in metallurgy, it would be found that much of the work is being devoted to the improvement of corrosion-resisting alloys. The accompanying article by Dr. Saklatwalla affords an excellent word picture of the scope of these investigations, and shows the relative importance of the ferrous alloys in meeting the challenge of corrosion.

This timely review of recent progress is abstracted from a paper presented originally before the Delaware section of the American Chemical society March 20, 1929 and published subsequently in Vol. 1, No. 1 of "Metals and Alloys." It is presented to readers of IRON TRADE REVIEW *as a concise, impartial statement of one of the most important current developments in the art of metallurgy.*

—THE EDITORS.

with small percentages of nickel has been commonly used for caustic pots. The caustic attacks the graphite lamellae in iron and any alloy which favorably changes the distribution of graphite is helpful. For acid-resistance the main iron alloys have been those containing high percentages of silicon, which contain from 13 to 17 per cent silicon and sometimes small percentages of other elements, such as manganese, aluminum and nickel. They have been marketed in this country and in Europe under various trade names. These alloys resist the action of acids well, especially of sulphuric and nitric and dilute cold hydrochloric, but have the disadvantage of lack of physical strength, absence of machinability, and brittleness. Where the acid action is combined with heat they have the further disadvantage of not withstanding sudden changes of temperature and of possessing low heat-conductivity.

The field of high alloy cast irons has not been thoroughly investigated and compositions which have proved of merit in steels may be duplicated to advantage in cast materials. High manganese content iron of the type of Hadfield's steel and high chromium and chromium-nickel and chromium-copper and chromium-copper-silicon compositions have already been produced with high-carbon contents in the cast state for certain specific purposes of extreme service.

In the steel group within the past few years a considerable number of alloys have been brought out suitable for the requirements of the chemical industry withstanding the action of oxygen, hydrogen and nitrogen at high temperatures. Also, for acid resistance in the cold, more types are available than before, so that the selection of material on the part of the chemical engineer becomes perplexing.

Steels of medium alloy content have found considerable expansion in the chemical industry. Such steels containing nickel have been successfully used in caustic work and also in the manufacture of parts of equipment not subject to severe corrosion. In Europe chrome-nickel steel has been used in the catalyst chambers for synthetic ammonia but recently plants are being erected there with the use of chrome-vanadium instead of the chrome-nickel steel, indicating that the latter has not proved altogether successful. In this country the synthetic ammonia industry has very largely standardized on chrome-vanadium steel. Their use has been accompanied with marked lack of failure. They have the decided advantage not only of surface stability but of maintaining load-carrying capacity at over 500 degrees Cent. temperature. Chrome-vanadium composition has the further advantage that it is a steel eminently suitable for casting large ingots such as would be required for producing the one-piece forged catalyst chambers. Not all steels are capable of being successfully cast in large ingots. The success of chrome-vanadium steel in the synthetic ammonia industry has paved the way for its use in oil refinery work where high temperature and pressure and gas penetration have to be combated. Also, these properties promise in the future to make its use for high pressure boiler work general. Chromium-copper steels, either with low or high percentage of silicon, have come to the fore lately. They have some very excellent heat and acid-resistant properties. The field of the low alloy corrosion-resistant steels has not yet been exploited and promises a very fertile field for investigation by the chemical industry.

The tonnage of high alloy steels going into the chemical industry is daily increasing. This is due to the ability of the metallurgist to meet the specifications and more fully understand the requirements of the chemical trade. The most useful of this type is the group of high-chromium steels. Such steels have changed the aspect of the nitric acid industry not only from the standpoint of manufacturing equipment but also from that of shipping containers. Such steels can be produced in all forms of fabrication as plates, sheets, tubing, forgings and can also be welded. However, great care and extreme caution are necessary to remove the effects of fabrication by means of the requisite heat treatment.

If properly treated and judiciously handled, these steels are capable of excellent service and portend to change the aspect of various chemical operations as they have already done for the nitric acid industry. The addition of nickel confers added fabricating properties to such steels and the addition of copper meets the requirements of certain types of corrosion. In order to offset their lack of machinability, zirconium sulphide has been added to them which has overcome this difficulty successfully.

(*Concluded on Page* 561)

Analyses and Uses of Typical Anti-Corrosion Alloys

Name of Metal or Alloy	Nominal Chemical Composition (Per Cent) C	Si	Mn	Ni	Cr	Fe	V	Cu	Al	Zn	Tensile Strength 1000 Lbs./Sq. In. Cast	Wrought	Field of Application
Pure Aluminum	.....	0.2	.....	.....	.....	0.5	.....	0.1	99.2	....	.....	12-22	Acetic acid, nitric acid, foodstuffs
Manganese Aluminum	.....	0.3	1.5	.....	.....	0.5	.....	0.2	97.5	....	16-20	14-26	Sea waters, natural waters, brine
Pure Copper	.....	.....	.....	.....	.....	.....	.....	99.8	.....	....	20-22	25-30	Sulphuric acid, hydrochloric acid, alkalis, salts
Brass	.....	.....	.....	.....	.....	.....	.....	67	.....	33	35-45	45-80	Sea water, natural waters, salts
Everdur	.....	4.5	1.0	.....	.....	.....	.....	94.5	.....	....	50-60	55-140	Similar to copper and brass
Pure Nickel	0.1	.....	0.1	99.2	.....	0.4	.....	0.2	.....	....	.....	60-130	Sulphuric acid, hydrochloric acid, foodstuffs, alkalis
Ni-Cr-Steel	0.15	0.20	0.30	4.0	0.75	†	.....	.....	.....	....	.....	70-150	Similar to pure nickel, also sea water
Nichrome	1	0.5	2	65	15.5	16	.....	.....	.....	....	50-60	.....	General high temperature processes
Monel	*	*	2	67	.....	2	.....	27	.....	....	65-75	65-140	Ammonia synthesis, oil refining
Cr-V-Steel	0.20	0.20	0.75	.....	1.00	†	0.15	.....	.....	....	.....	70-175	Ammonia synthesis, oil refining, steam service
Copper Steel	0.25	0.02	0.50	.....	.....	†	.....	0.90	.....	....	.....	70-75	Oil industry (field service in natural and salt waters)
Stainless Iron	0.10	0.30	0.40	.....	12.0	†	.....	.....	.....	....	.....	60-240	All of this group find application in the General Chemical Industry, oil refining, nitric and mixed acids, acetic acid, foodstuffs, dyes, alkalis, acid and neutral salts, high temperature processes, etc.
Chrome Iron	0.10	0.60	0.40	.....	17.0	†	.....	.....	.....	....	60-100‡	80-200	
Nickel-Chrome Iron	0.15	0.30	0.40	8.0	18.0	†	.....	.....	.....	....	70-110	90-250	
Ni-Cr-Si Steel	0.30	2.5	0.50	25.0	17.0	†	.....	.....	.....	....	.....	100-200	

*C + Si — 0.5 (Wrought) or 1.5 (Cast).
†Remainder (Including Impurities).
‡Somewhat Higher Carbon when Cast.

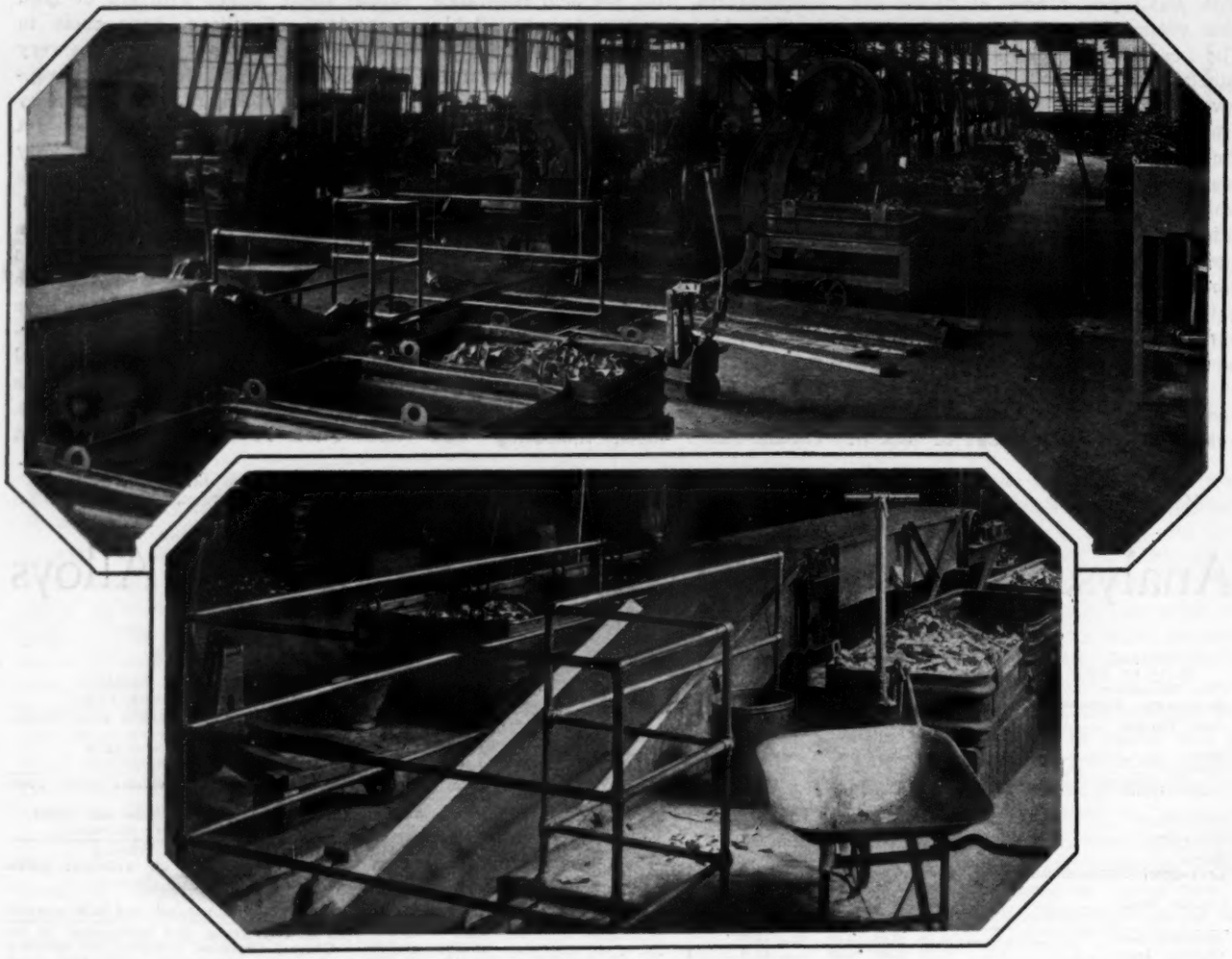


Fig. 1—New production machine shop with presses and other machines for finishing operations. Below is the end of the conveyor belt which brings material from the presses to a sorting table

Small Forgings Plant Undergoes Progressive Expansion

Five New Buildings Added as Business Increased—Operations Started in 1920 with Two Hammers, 18 Now Are Operated 22 Hours a Day

By A. H. Allen

Editorial Representative, Iron Trade Review

FORGE shop activity in the Cleveland district is at a high level, due principally to record production accomplishments in the automobile industry. In addition, the wide variety and large quantities of smaller forgings required by most all industrial lines furnish a wealth of orders which keeps medium-size plants working day and night. Typical of these plants is that of the Buckeye Forging Co., 10003 Harvard avenue, Cleveland, which for the past five years has been operating 22 hours a day with a force of 185 men. No radical modification of this program is in sight.

The Buckeye Forging Co. started operations in 1920 with one brick building containing two forge hammers and other incidental machinery and equipment. This building was destroyed by fire in 1921 and to keep up with orders on hand the company leased and operated hammers in various localities around Cleveland. Construction was begun immediately on a new plant at the site of the

old one, where the company now owns 2½ acres of land. The new building was provided with 10 hammers, machine equipment necessary for immediate use and office space on the second floor. From 1922, when this structure was completed, until the present a steadily increasing business in small forgings has necessitated one addition after another to manufacturing facilities. A separate production machine shop, a die shop addition to this machine shop, a second forge building with eight more hammers and, finally, a new production machine shop were successive steps in the expansion program. Recently the machine shop was converted into a warehouse and large stocks of forgings now are kept on hand here. The latest addition, the new production machine shop, was opened in the summer of 1928.

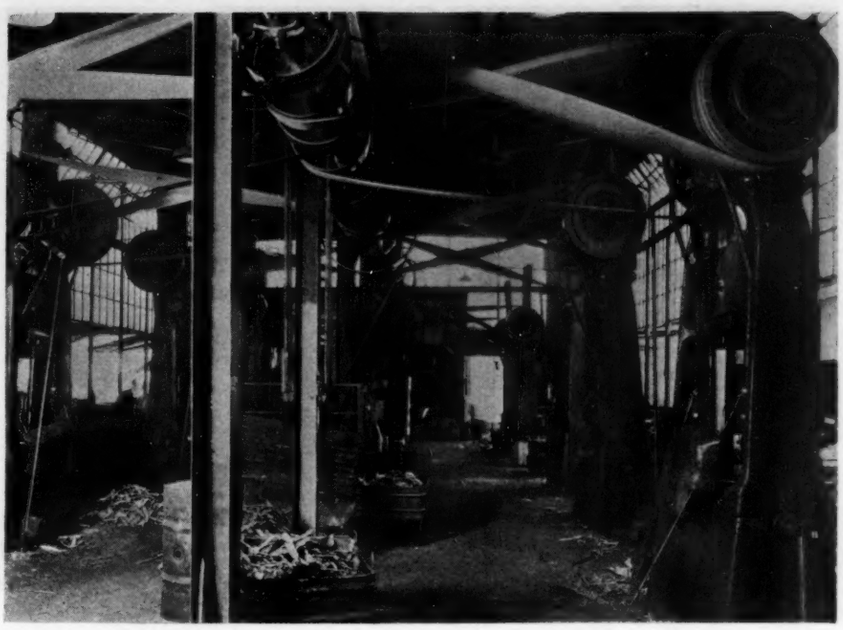


Fig. 2—View of one forge shop, showing ten hammers varying in capacity from 600 to 1000 pounds

Products Cover Wide Range

Products which the company manufactures include S.A.E. carburetor and brake rod clevises, finished brake rods of all sizes, small drop forgings up to 3 or 4 pounds in weight made to customers' specifications for automotive and industrial interests, steel barrel and tank forged flanges completely machined and ranging from ¼-inch to 4 inches in diameter, and lifting rings and eyebolts. Most clevises and brake rods are made by forging the yoke, milling and drilling it and then welding it to the shank in an electric welding machine provided for the purpose. Tank and barrel flanges are carried in stock as standard material. Forged lifting rings and eyebolts comprise a comparatively new line into which the company is branching. Many special jobs are handled such as small forgings for automobile bumper assemblies, screw caps, brake pedals and the like.

The older forge shop shown in Fig. 2 is equipped with ten board drop hammers built by the Chambersburg Engineering Co., Chambersburg, Pa., and varying from 600 to 1000 pounds in capacity. They are arranged in two rows, one on each side of the 50 by 100-foot floor space. Stock is heated in small gas-fired forge furnaces which are adjacent to the hammers. After the rough forging operations, the parts are transferred to the production machine shop for final trimming and machining.

In the newer forge shop are eight hammers, similar to the others, but higher in capacity, varying from 1200 to 2000 pounds. These hammers are served by furnaces similar to those in the other shop. This building measures 50 by 60 feet in floor space.

The present warehouse adjoins a railroad which makes shipping facilities ideal. As shown in Fig. 4 rows of bins have been erected in this building and stocks of various types of small forgings are kept in them. Many of the forgings are packed for shipment in cloth sacks or wooden kegs. In the same building are operated several upsetting machines. Rod stock is heated and placed in these machines and clamped. Force is applied and the rod upset to conform to whatever shape die is in the machine.

A modern die and tool shop is

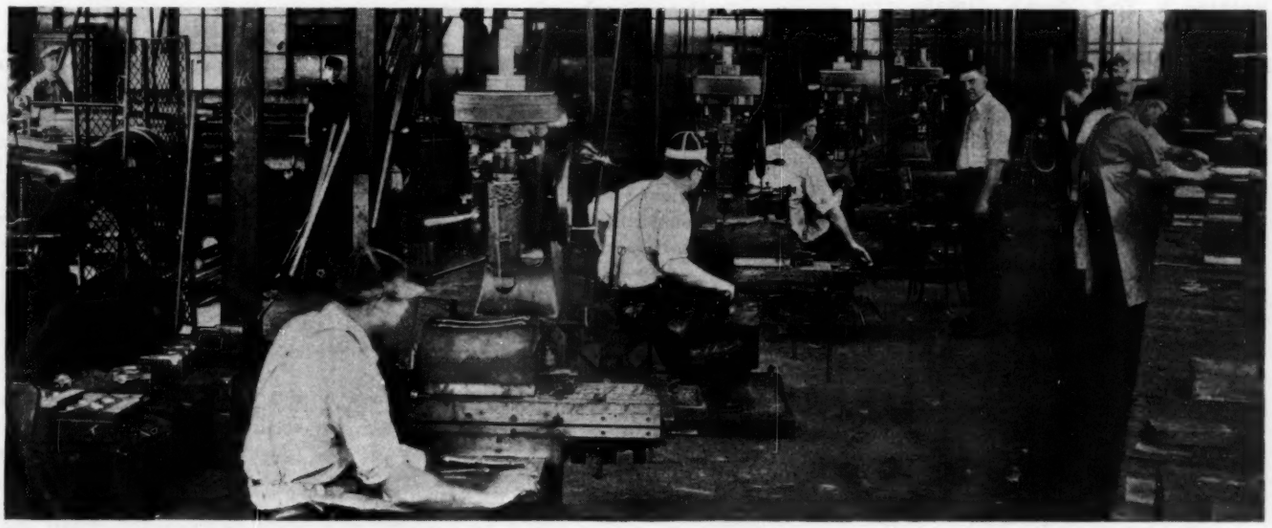


Fig. 3—Tool and die shop where all die-sinking and tool dressing operations are performed. Hand work in done on the bench at the right

Fig. 4—Interior of warehouse where forgings are sorted, inspected, stored and packed preparatory to shipment

entered through the warehouse. Here the various dies for the hammers are tooled out on special machines designed for this work. Some of the die sinking is done partially by hand. In making any type of die a blueprint of the shape to be sunk is received and the design etched on the die block. The block then is clamped in the milling machine and the outline of the design followed by the operator. The many shapes of tools for use in various metalworking machines in the plant are formed and ground also in this shop, a view of which is shown in Fig. 3.

New Building Houses Presses

The newest building, a production machine shop as it is called and shown in Fig. 1, is a one-story building 60 by 150 feet in size. In it are located the presses for cutting off flashings and punching out holes. These presses, built by the Niagara Machine & Tool Works, Buffalo, are erected in a single line along one side of the building. Operators receive stock in trucks and feed each piece into the press individually. The necessary finishing operations are performed and flashing, punching and finished piece all fall upon a moving conveyor belt which travels about 6 inches below the floor level the full length of the building. The belt, motor-driven and 24 inches wide, carries all material from the presses to a hand picking table where the finished pieces are separated and sorted into proper conveyor trucks.

Waste products are dropped off the end of the belt into receptacles and transferred to scrap storage outside the building. By such a system material handling after the press operations is simplified greatly since the moving belt picks up all material coming from the presses and delivers it to the sorting table. Along the other side of this machine shop are milling machines, turret lathes, pipe threading machines, bolt cutting machines, multiple drills and similar equipment for finish machine operations on the forgings. Two lineshafts, powered by 40-horsepower motors, run the length of the building.

A bulldozing machine is operated for making U-bolts and similar parts which require bending treatment. Other accessory equipment includes a wire and rod straightener and cutter which receives wire and light rods in reels and straightens and cuts them to specified lengths preparatory to forging.

Stock is received from mills in the form of rounds, squares and flats ranging in size from ¼-inch to 2¼ inches. All varieties of carbon steel and alloy steels are used, according to specifications, each piece being painted on the end to distinguish its characteristic analysis. This material is placed in open storage near one of the hammer shops. Storage bins are provided also for flashings, turnings and clippings. This scrap is loaded into cars by means of a special loading device consisting of an inclined endless belt, driven by an electric motor. The scrap is shoveled on the belt and is conveyed up and into cars on a nearby siding.

Two Railroads Handle Shipping

Two railroads are in close proximity to the plant, thereby obviating any difficulties which the shipping problem might present. Company offices are located in a frame building a short distance from the plant itself. Four large locker and washrooms are provided for employes. The company carries group accident insurance for its employes.

Officers of the firm are: J. W. Baxter, president; H. F. Bower, vice president and general superintendent; P. W. Andrus, secretary; and E. T. C. Schwan, treasurer.

Elutriation Method Used for Ore Sizing

A method for the sizing of ore by elutriation developed at the intermountain experiment station of the bureau of mines, Salt Lake City, Utah, is described in serial 2951, just published. The work was done in cooperation with the University of Utah.

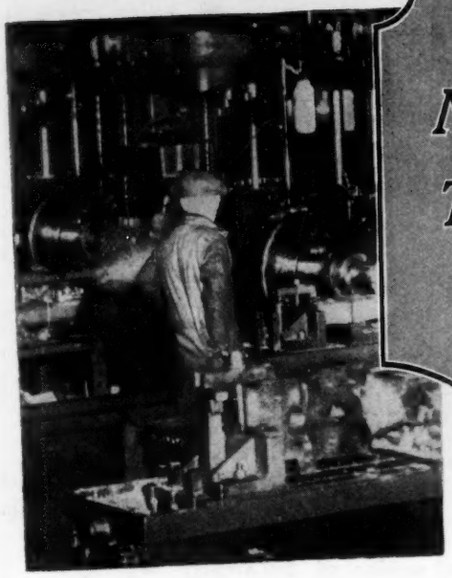
The modern practice of grinding ores so that often 80 per cent or more of the product is finer than 200 mesh makes it desirable to supplement sieve sizing so as to extend considerably the range of sizing. Moreover, the fact that the material finer than sieve size represents the major part of the work done in grinding emphasizes this need in any investigation of crushing efficiency.

A method based on the settling rate of particles in water appeared to be most practical for sizing finely ground ores. There are two possible methods of utilizing this principle, one based on free settling or sedimentation, and the other on separation by means of a rising current of water, or elutriation. In sedimentation, mechanical entanglement causes material at the start to settle in a mass, and this persists throughout. As this feature is largely eliminated by elutriation, which permits a comparatively clean separation of the various sizes, the elutriation method was adopted.

Expect Heavy Attendance at Machinery Show

Nearly 250 separate displays, occupying areas ranging from 3000 square feet down, will be presented at the National Machine Tool Builders' exposition in the Cleveland public auditorium, Sept. 30-Oct. 4. The entire floor area occupied by this year's show will exceed by 25 per cent that of the 1927 show which also was held in Cleveland. A 50 per cent increase in registrants over the 1927 figure is anticipated.

The Budd Wheel Co., Detroit, has closed a contract with a large midwestern truck company to supply its 1930 requirements for steel disk wheels, according to announcement of the company. The contract will total about $225,000.



New Machine Tools and Shop Equipment

"Without tools man is nothing, with tools he is all."—Carlyle

Semiautomatic Hydraulic Cam Grinder

No. 178

Landis Tool Co., Waynesboro, Pa., announces the design of a new 5 by 40 inch semiautomatic hydraulic cam grinder with hydraulic control and operation of timing mechanism, work carriage traversal, wheel feed, wheel truing fixture and work cradle. Although the machine, shown in the accompanying illustration, is referred to as semiautomatic it is actually full automatic after the grinding cycle for the first cam on the shaft has begun. The operator dogs the shaft, places it in the machine, throws the work rest jaws into position, starts work rotation by throwing a lever and lastly throws in the main control lever. With the movement of the main control the work carriage moves bringing the first cam to grinding position at which point the latch on the front of the bed drops into the first notch of the hardened notch plate on the front of the carriage. Immediately the oil pressure is cut off from the carriage traversing cylinder and oil enters the hydraulic straight infeed cylinder causing the wheel base to feed in rapidly and at the same time the oil pressure is reversed in the work cradle cylinder causing the cradle to swing back until the master cam comes in contact with the roller. By this time the grinding wheel has come into contact with the work when the speed of the feeding-in movement slows down to the predetermined grinding speed; feeding in continues at this speed until the wheel base comes against a positive stop indicating that the work has been ground to size. Shortly before the end of the cut the work speed automatically slows down, but the fast work speed is resumed again as soon as the cam is finished.

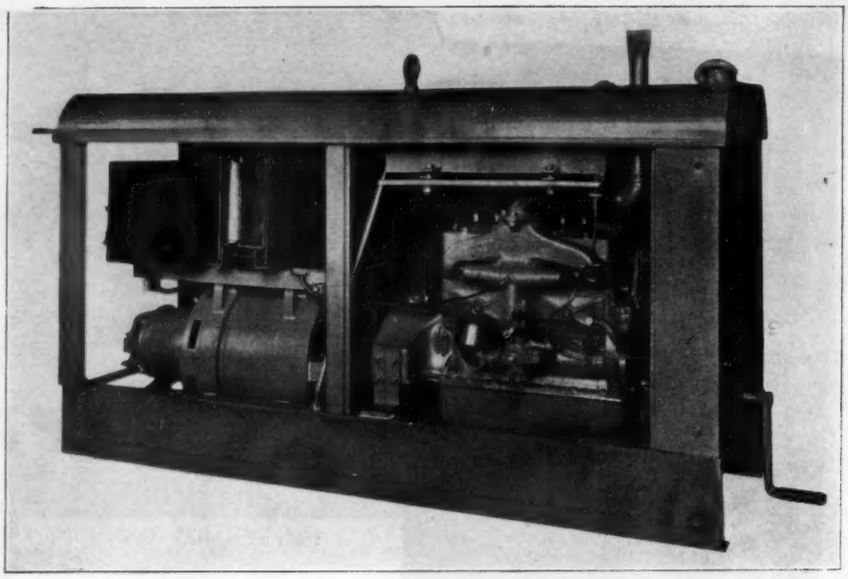
After the first cam has been ground to size the timing cam has made one complete revolution so it trips the latch, this causing the wheel base to move backword to its starting position; the cradle swings forward and the table traverses, bringing the second cam to grinding position where it stops as the latch enters the second notch in the notch plate. At this point the master cam roller automatically indexes on its shaft to bring it in line with the second cam on the master. This cycle of operations is repeated for each cam including the

Iron Trade Review's Calendar of New Equipment

Item	Comment	Builder	No.	Date Described	Page
Electrode	For welding mild steel and cast iron repair work	Lincoln Electric Co.	160	Aug. 1	265
Blue-printing machine	Exposes, develops, washes and dries prints continuously	C. F. Pease Co.	161	Aug. 1	265
Trucks	Three-wheel trucks for carrying acetylene generators	Oxweld Acetylene Co.	162	Aug. 1	265
Milling Machine	Cam feed to head; suitable for high production	Kent-Owens Machine Co.	163	Aug. 1	266
Tapping machine	Friction-driven, geared and semiautomatic	Rickert-Shafer Co.	164	Aug. 1	266
Woodworking machine	Improvements on former type; portable, increased power	De Walt Products Corp.	165	Aug. 1	266
Water coolers	Electric; control of temperature provided	Frigidaire Corp.	166	Aug. 1	267
Switch mechanism	Drum switch operating mechanism for use in crane cabs	General Electric Co.	167	Aug. 8	331
Cleaner	Air motor driving rotating wire brush; portable	Paasche Airbrush Co.	168	Aug. 8	331
Grinder	Electric bench type; 6-inch wheels; ball bearings	Millers Falls Co.	169	Aug. 8	331
Switch	Field discharge switch for use with magnetic chucks	Taft-Pierce Mfg. Co.	170	Aug. 15	398
Resistor	For use in resistance banks; rustproof and noncorrodible	Cutler-Hammer Inc.	171	Aug. 15	398
Welding machines	Power-driven vertical welder and double-roller seam welder	Thomson Electric Welding Co.	172	Aug. 15	399
Furnace	Continuous heat treating mesh-belt conveyor type	General Electric Co.	173	Aug. 15	399
Bearings	Single-row radial type; solid rollers	Hyatt Roller Bearing Co.	174	Aug. 22	457
Furnace	Designed for heat treating aluminum alloys	General Electric Co.	175	Aug. 22	457
Bucket	Clamshell type; increased speed and power	Erie Steel Construction Co.	176	Aug. 22	458
Presses	Single-crank power presses; 32 and 56-ton capacities	Niagara Machine & Tool Works	177	Aug. 22	458
Cam grinder	Semiautomatic and hydraulic features incorporated	Landis Tool Co.	178	Aug. 29	529
Welder	Gas-engine driven; 200-ampere capacity	Lincoln Electric Co.	179	Aug. 29	530
Tongs	Entirely automatic; for handling blocks, slabs, etc.	Heppenstall Forge & Knife Co.	180	Aug. 29	530
Fixture	For regrinding surfaces of grinder support blades	Cincinnati Milling Machine Co.	181	Aug. 29	530
Drill	16-inch sensitive type; bench and floor models	Buffalo Forge Co.	182	Aug. 29	531
Gear hobbing machine	Motor-in-base; oil filter; other improvements	Brown & Sharpe Mfg. Co.	183	Aug. 29	531
Jig borers	Numerous improvements on old types	Societe Genevoise d'Instr. de Phys.	184	Aug. 29	531

fuel pump cam if used. After the last cam on the shaft is finished the wheel base moves to the extreme backward position, the work cradle swings away from the roller and the carriage moves a short distance, throwing the main control lever and stopping all motion except work rotation. The operator then changes shafts, having first stopped work rotation.

Shafts may be ground from left to right or vice versa. Little time is lost in truing the grinding wheel as the diamond is driven hydraulically and the wheel may be trued without disturbing the work. End drive to the grinding wheel spindle is through a multiple V-belt arrangement. Two motors are used on the machine, a 15-horsepower main drive motor and a ½-horsepower work drive motor.



No. 179—Gas-engine driven welder of 200-ampere capacity

Develops New Gas Engine Driven Welder

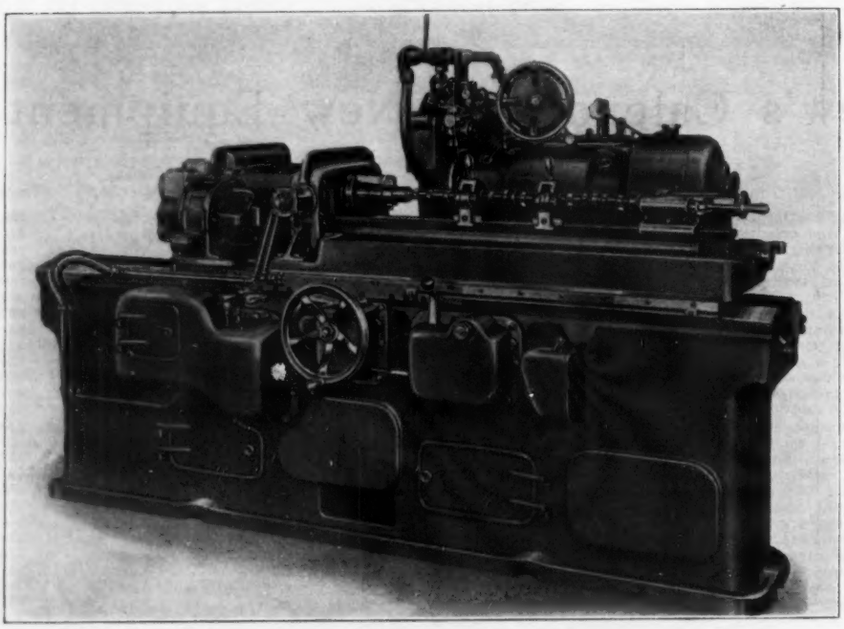
No. 179

Lincoln Electric Co., Coit road and Kirby avenue, Cleveland, is introducing to the trade a new model gas-engine driven welder for use where electric power is not available. The new welder, shown in the accompanying illustration, is of 200-ampere rating and is powered by a 4-cylinder gas engine operating at a speed of 1500 revolutions per minute. An automatic ilding device is incorporated which automatically reduces the speed of the engine when welding operations cease and automatically accelerates the engine to proper speed as soon as welding is started. It has been estimated that this idling device will reduce fuel consumption by approximately 25 per cent. Another feature of the welder is the protection afforded the moving parts by the welded steel canopy which encloses the outfit. Operating controls are unified and enclosed in a ventilated steel cabinet.

Automatic Safety Tongs Minimize Hazards

No. 180

Heppenstall Forge & Knife Co., Pittsburgh, is introducing new automatic safety tongs for handling metals of various kinds in the form of ingots, blocks, slabs, billets, blanks or molds. The tongs are attached to the hook of a crane or other type of hoist and are operated entirely by the craneman. Suspension from the hoist is by a single rope. The tongs, as shown in the accompanying illustration, are normally in the open position; a single down and up movement grips the load and the subsequent down and up movement releases it, leaving the tongs again in the open position ready for gripping. All manual labor is said to be eliminated with the possible exception of one groundman who may have to prepare the load so that the tongs will have access to it. However, the groundman does not handle the tongs at any time except in cramped quarters where he guides them. No springs or counterweights are used in the design of the tongs and no lubrication or adjustment is required. For light and small loads a single shear and blade design is employed; for large and heavy loads a double or split blade design is used which is said to relieve the center bolt of all but low shearing stresses, balance the entire assembly and eliminate the tendency to twist and snap off. The automatic latch which consecutively opens and closes the tongs is purely mechanical, consisting of two moving parts, a connecting rod and revolving crosshead. In addition to savings produced due to the elimination of groundmen, accompanying hazards are minimized.

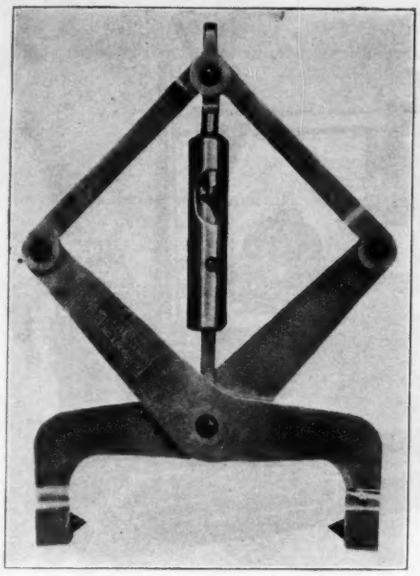


No. 178—Semiautomatic hydraulic cam grinding machine

Fixture for Regrinding Support Blades

No. 181

Cincinnati Milling Machine Co., Cincinnati, has developed a new attachment to be used for regrinding the wearing surfaces of all standard support blades for centerless grinders



No. 180—Automatic safety tongs

manufactured by the company. Blades must be reground to eliminate the hollow resulting from wear, that produces chatter, out of roundness and inaccurate work. The equipment also permits changing the blade angle. Reground blades will not be affected by warping since they are held in the fixture in the same manner as on the grinder, as shown in the accompanying illustration. Time required to make the setup is 2 minutes and support blades are finished all over excepting the wearing surface prior to the grinding operation. The fixture is made of aluminum and is constructed rigidly. It will permit support blades with a maximum length of 16⅝ inches, width ¾ inch and height 4 inches, to be ground at any angle from a flat top to 45 degrees. The fixture can be supplied for application to a cutter grinder already in use or cutter and tool grinder equipment can be furnished with the fixture.

Sensitive Drill Made in Bench, Floor Types

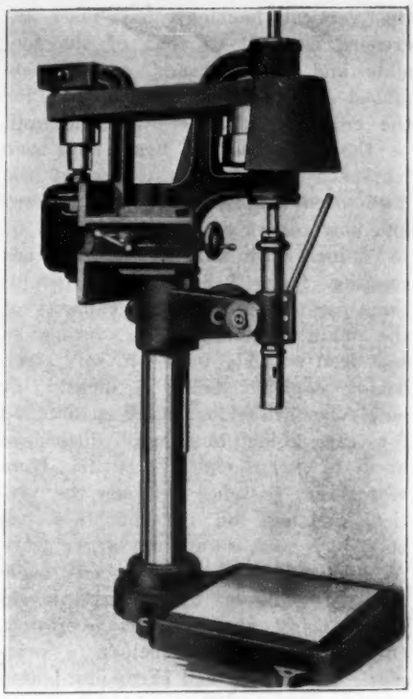
No. 182

Buffalo Forge Co., Buffalo, recently placed on the market a new 16-inch sensitive drill, motor driven and equipped with ball bearings throughout. The drill is made in bench and floor types, the bench type, shown in the accompanying illustration, being 48 inches high and the floor type 76 inches high. The floor type is erected on a floor base 21 inches in diameter and has a tilting table 12 inches square. Spindle travel is 7 inches and head travel is 8½ inches. Cone pulleys are provided on the spindle and motor to produce three different spindle speeds, 418, 835 and 1725 revolutions per minute. The machine will drill to the center of a 16-inch circle. Pulley and motor support is made of cast iron while the column is of steel. The outer part of the spindle is guided by a sleeve running in bronze bearings provided with a ball thrust bearing. The belt can be taken up by loosening the hand-operated nut on the shifter bracket which permits adjustment of the belt by the handwheel at the left side of the machine. A hand lever feed is provided on the bench type and hand lever and foot treadle are provided for speed and convenience on the floor type.

Improves Design of Gear Hobbing Machines

No. 183

Brown & Sharpe Mfg. Co., Providence, R. I., recently has announced the redesign of a gear hobbing machine which the company manufactures, shown in the accompanying illustration, and the incorporation of several new features in the machine. The unit is now of the motor-in-base type and is equipped with an oil filter. The oiling arrangement has been simplified and the cutter coolant pump relocated at the rear of the feed case. Although designed primarily for drive through a motor installed in the base of the machine drive is possible from an overhead shaft with a 4-inch belt driving the machine at a constant speed of 500 revolutions per minute. The oil filter is located at the rear of the machine where it can be



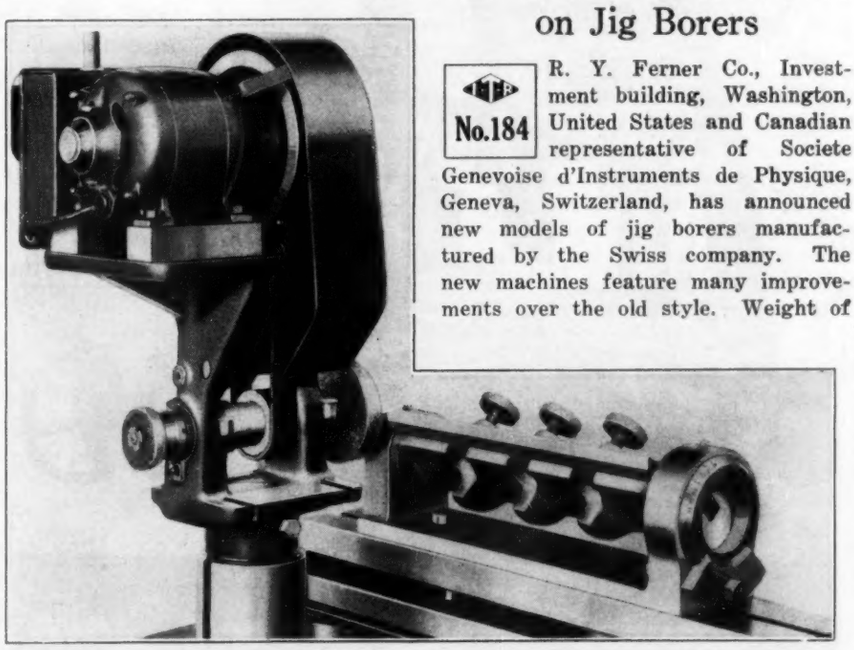
No. 182—Bench-type sensitive drill

cleaned easily. Oil is pumped from the feed case through the filter to the indexing mechanism and the feed case bearings from where the overflow is drained back to the feed case supply. The hob slide is oiled from one station for both the feed screw and the ways. The cutter coolant pump may be disconnected when the machine is cutting cast iron. Indexing mechanisms, driving pulley shaft and hob driving shaft are carried on antifriction bearings.

Announces Improvements on Jig Borers

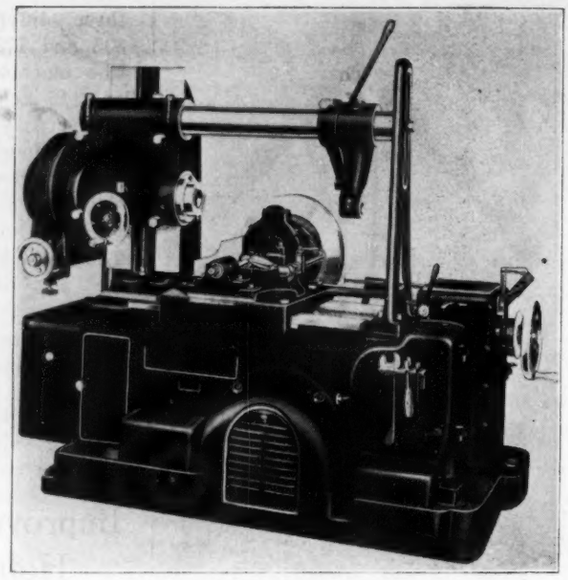
No. 184

R. Y. Ferner Co., Investment building, Washington, United States and Canadian representative of Societe Genevoise d'Instruments de Physique, Geneva, Switzerland, has announced new models of jig borers manufactured by the Swiss company. The new machines feature many improvements over the old style. Weight of

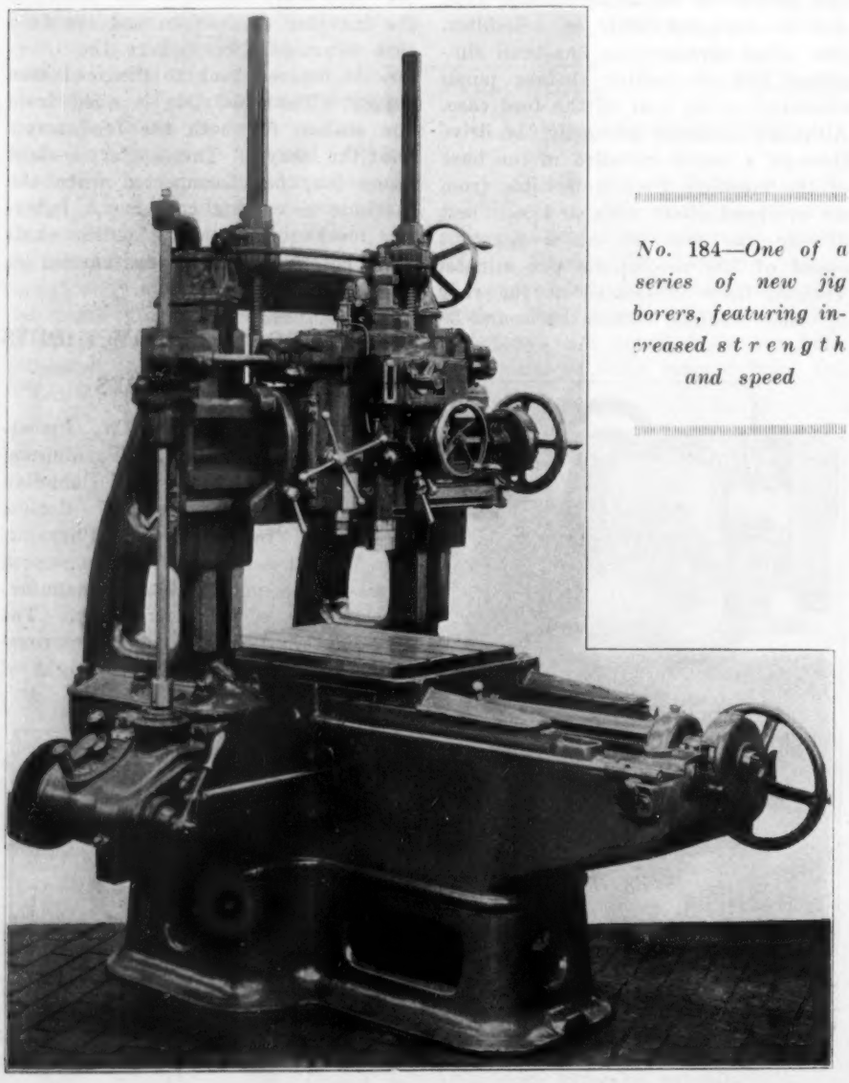


No. 181—Fixture for regrinding wearing surfaces of centerless grinder support blades

the vertical housings has been increased as well as that of the tool slide and boring heads, and a new ribbed design has been adopted for the crossrail. Diameter of the quill in the main boring head has been increased 21 per cent. Size of the high-speed spindle has been increased and now covers a range of from 3/64 to ½-inch with nine available speeds ranging from 212 to 1870 revolutions per minute. Drilling capacity of the main spindle is 1¾ inches in cast iron and 1¼ inches in soft steel, boring capacity being 6 inches. A new form of holder has been adopted for the guide bushings which are used to keep ends of drills from vibrating. Distance between the vertical housings on the machines has been increased, admitting larger work pieces. Changes have been made to the rectangular and circular tables which bring about easier operation. Other improvements include a prismatic microscope and chromium-plated reference square for making accurate settings, a vertical indicator device adapted to the checking of the parallelism of a work piece with the table or measurement of depth or counterboring, and a micrometer drum on the shaft of the hand feed of both spindles to provide for measurement of the exact depth of blind holes or of counter boring. One of the new machines is shown in the accompanying illustration.



No. 183—Gear hobbing machine of motor-in-base type, equipped with oil filter and other improvements



No. 184—One of a series of new jig borers, featuring increased strength and speed

Steel Fireproofing Is Subject of Booklet

"Fireproofing Structural Steel" is the title of a new booklet published by the American Institute of Steel Construction Inc. The author is Jack Singleton, district engineer of the institute at Topeka, Kans. As the name implies, the contents of the 14 pages are devoted to a comprehensive survey and discussion of materials to protect structural steel against fire hazards.

Data given by Mr. Singleton of fireproofing materials covers concrete, brick, clay tile, gypsum, plaster, gunite, aerocrete, haydite, asbestic plasters and asbestos products. In the introductory paragraphs of the book he says, "But one reason exists for the protection of structural steel against fire—that it shall be insulated against a rise in temperature which would seriously impair its ability to sustain the loads at the designated unit stresses." Continuing, the author shows the rise in the use of steel for building since 1912.

Pullman Plant Ready

Woodward Iron Co. has laid pipe from its by-product coke works to the new car works of the Pullman Car & Mfg. Corp., Bessemer, Ala., and has notified the management that it is ready to turn on gas when needed. Pullman Car & Mfg. Corp. will begin in the next few days trying out machinery, formal opening of the new industry to be about Sept. 16.

Editorials

Metal Congress Offers New Ideas

WE HEAR much today of the remarkable speed and stamina of automobiles, aircraft and locomotives. Endurance records, which a few years back would have been considered idle dreams, now are established and broken with amazing rapidity. Technical skill of high order is required to design and perfect structures and mechanisms capable of fulfilling the requirements demanded in this age of speed, but at the same time credit must be given the army of technicians which has developed engineering materials of construction and the processes of fabrication.

Many years of painstaking effort have been spent in developing new steels and nonferrous alloys to give physical properties equal to the demands of service. With the material available, another important problem has been the perfection of methods of treatment and fabrication which would produce with uniformity and certainty maximum strengths, toughness, hardness, etc.

Progress in the metal-making, metal-treating and metal-working industries has been so rapid that technical societies allied with the field find it advantageous to hold meetings concurrently and thereby derive the greatest benefit from discussions of problems and an interchange of information. The meeting for 1929 is to be held in Cleveland, Sept. 9-13, with five technical groups participating—the American Society for Steel Treating, American Welding society, Institute of Metals and Iron and Steel divisions of the American Institute of Mining and Metallurgical Engineers and Iron and Steel division of the American Society of Mechanical Engineers.

In conjunction with the National Metal congress, as the proceedings will be known, a National Metal exposition of some 70,000 square feet and 230 exhibitors will display products and equipment pertinent to the steel and metal industries. Members of the five technical organizations and others interested in metal treating will find time spent in attending the congress and exposition paying dividends through the acquisition of new ideas.

Every Metal Has Its Market

WHILE iron and steel production and earnings are climbing to high record this year, they are enjoying good company with the other metals. One of the most remarkable accomplishments is in nickel, an industry closely related to steel. Statistics on nickel used in the United States this year are not available, but nickel supplies have been in a tight position even with imports each month running nearly half again as large as a year ago. The nickel industry has large customers, however, outside of iron and steel, in the forms of nickel silver, nickel plating, and mill products of nickel and monel. All of these outlets have expanded.

Aluminum statistics are not known, but imports, which are the fringe of the market, have been increased nearly 50 per cent, largely for the account of the domestic producer. And the stock of this company has jumped from $146 early in the year to $500 a share.

Copper shipments to domestic users so far this year have been 31 per cent larger than a year ago. Among the metals on which definite statistics are published, this is the greatest increase this year. Domestic shipments of tin increased 25 per cent, while output of steel ingots was increasing 18 per cent. Lead and zinc shipments increased by smaller percentages. In all of these metals except the latter two it would have been difficult for producers to have delivered much more to customers.

These great growths and close approximation to capacity show that the present high industrial development of the United States affords ample room for all metals. At times they tread on each other's toes in competition for outlets along their borderlands. This contest, now between steel and copper, again between copper and aluminum, and another time a three-cornered race among them, is inevitable, a sign of vitality, and a stimulant to the highest accomplishments in industry.

Current big tonnages and profits give further assurance that all metals can get their share of business at fair and reasonable prices.

Value of Statistics Is Individual

A COLLEGE professor writing in a leading financial weekly comments upon the impairment of barometers of business activity. Migration of labor into new industries has made employment statistics unreliable, he says. Car loadings have been vitiated by the shrinkage in coal traffic, resulting from more efficient utilization of coal and increasing

resort to waterpower. Unfilled tonnage of the United States Steel Corp. has lost its barometric significance with the advent of hand-to-mouth buying. Pig iron production is less a guide to iron and steel activity as more scrap is melted. And so on.

To the speculator following the ticker and concerned only with skimming cream off the stock market the premises seem sound and the conclusion convincing. But there can be no blanket condemnation of statistics of industry because their value is in direct ratio to their individualization. It is true that scrap has replaced ore to a considerable extent in the manufacture of steel, but to the man in the industry the month-to-month progress of the blast furnaces is an indispensable guide. Unfilled tonnage performs a useful service, for when compared with production it indicates the volume of new business.

The college professor would be surprised to learn how closely the statistics which he discards are followed by men in the industry. A strikingly large number have their pet barometer, carefully noting the month-to-month statistics in their notebook. They have related the data to their own need and individualized them. Despite swifter motor car travel, a mile still is a mile, and so long as pig iron is made and the Steel corporation reports its unfilled orders they will be informative to those who interpret them.

Gary Grows, but Pennsylvania Leads

ALTHOUGH the largest individual steel plant in the United States, if not in the world, is in the sand dune region of the south shore of Lake Michigan, Pennsylvania remains firmly intrenched as the premier producing state.

In 1928, according to the American Iron and Steel institute annual statistical report, which is now available, Pennsylvania produced 17,714,644 gross tons or 34.3 per cent of the 51,544,180 tons of steel ingots and castings made in the United States. This was a slight decline from the 35.5 per cent of the 1927 total.

It is, however, considerably in the lead over the 12,973,646 tons or 25.2 per cent of the total, credited to Ohio in 1928. The year before Ohio accounted for only 24.3 per cent of all production. Illinois and Indiana, rightfully treated as one district on account of the proximity of South Chicago, Indiana Harbor and Gary, last year made 10,642,701 tons of steel, or 20.7 per cent. In 1927 the percentage was 20.5.

The Gary works of the Illinois Steel Co., with 45 open-hearth furnaces, has an ingot capacity of approximately 3,240,000 tons. Its team-mate at South Chicago, with 29 open hearths, is rated at 2,772,000 tons. Either plant, therefore, takes precedence over the Homestead works of the Carnegie Steel Co., whose 65 open hearths have a capacity of 2,548,000 tons. Homestead is the largest steelworks in the United States outside of the two Chicago district plants.

When the 14 additional open hearths, with 1,500,000 tons annual capacity, are brought in at Gary and South Chicago works of the Illinois company the pre-eminence of these plants will be increased, but not sufficiently to disturb Pennsylvania's dominance as a state.

Sharp Tariff Battle Is Assured

PRESIDENT HOOVER opened the tariff to limited revision at the current special session of congress with no great show of enthusiasm. Now that the senate finance committee has put its finishing touches on the house bill, in general extending protection for home industries, it is to be wondered if the President regrets the course which last fall's campaign dictated.

At best the tariff is onerous to defend, because it lends itself easily to a shallow, critical offensive. As it will be reported back to the senate, the metals schedule is difficult to explain popularly. In a period when the steel industry is reporting its best peacetime earnings, when production has broken all records, when requirements compel midsummer operations in excess of 90 per cent—can the man in the street be convinced that the industry needs further safeguarding?

That many of the proposed rates are inherently economically just matters not. It is true that the doubling of the 1922 duty on pig iron will assist the merchant stacks and not raise the cost of steel one penny, but the distinction is lost outside the industry. Steel producers have many arguments against a duty on manganese ore, but to the outsider there is an inconsistency in lowering the tariff wall around raw materials and raising it around finished products. In reality the tariff cushions the impact of imports in the coast markets and has no effect whatever on the predominating interior markets, but the opposition will gloss over this interpretation.

The hardest tariff battles always are waged in the senate. The action of the house ways and means committee and the house itself is merely a prelude to the final showdown of free traders and high protectionists on the floor of the senate. The opposition, seeking rehabilitation after the debacle of 1928, will seize upon the tariff issue as offering an offensive for the congressional elections in 1930. The forthcoming debate in the senate undoubtedly will be most acrimonious, and both the President and the steel industry seem let in for trenchant opposition and criticism.

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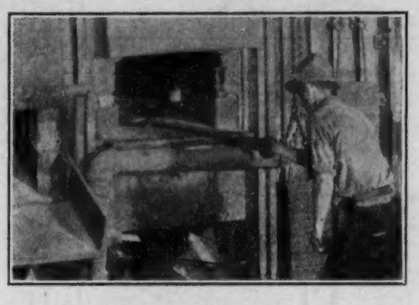

Cutting Tools Improved by Control of Furnace Atmosphere. Page 519.

Marks Progress in Metallurgy

THIS issue of IRON TRADE REVIEW *features arrangements for the National Metal congress and National Metal exposition in Cleveland, Sept. 9-13. The spectacular national air races and aeronautical exposition in that city beginning Aug. 24 and continuing for ten days is a reminder of the importance of the metal congress; progress in aviation has been due largely to a better understanding of metallurgical processes. Meetings will be held by the American Society for Steel Treating; American Welding society; Institute of Metals division and Iron and Steel division of the American Institute of Mining and Metallurgical Engineers, and the Iron and Steel division of the American Society of Mechanical Engineers. Complete programs will be found in the first section of this issue.*

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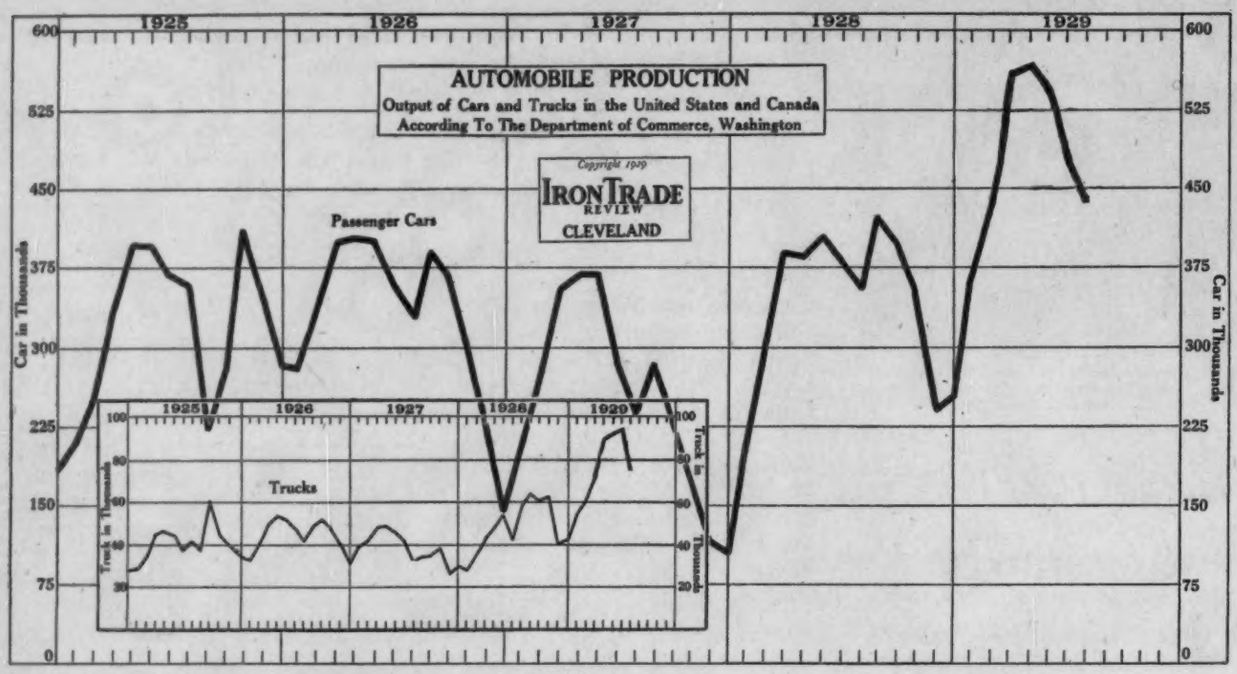
The Business Trend



Motor Car Output Continues at Record

By JOHN W. HILL, Financial Ediior

DURING the first seven months of 1929 the production of automobiles was 43 per cent greater than for the corresponding period in 1928. The total number was 3,929,545 cars and trucks for the United States and Canada compared with 2,743,821 in the preceding year. In July there was a reduction of 8 per cent in output from that of June, but the aggregate was 23 per cent more than in July, 1928.

THE production in July was 517,792 cars and trucks against 566,867 one month before and 417,312 one year before. The record of passenger car output for the first seven months of the year shows a gain of 38 per cent over that for the like period of 1928. The relative increase for trucks was 78 per cent.

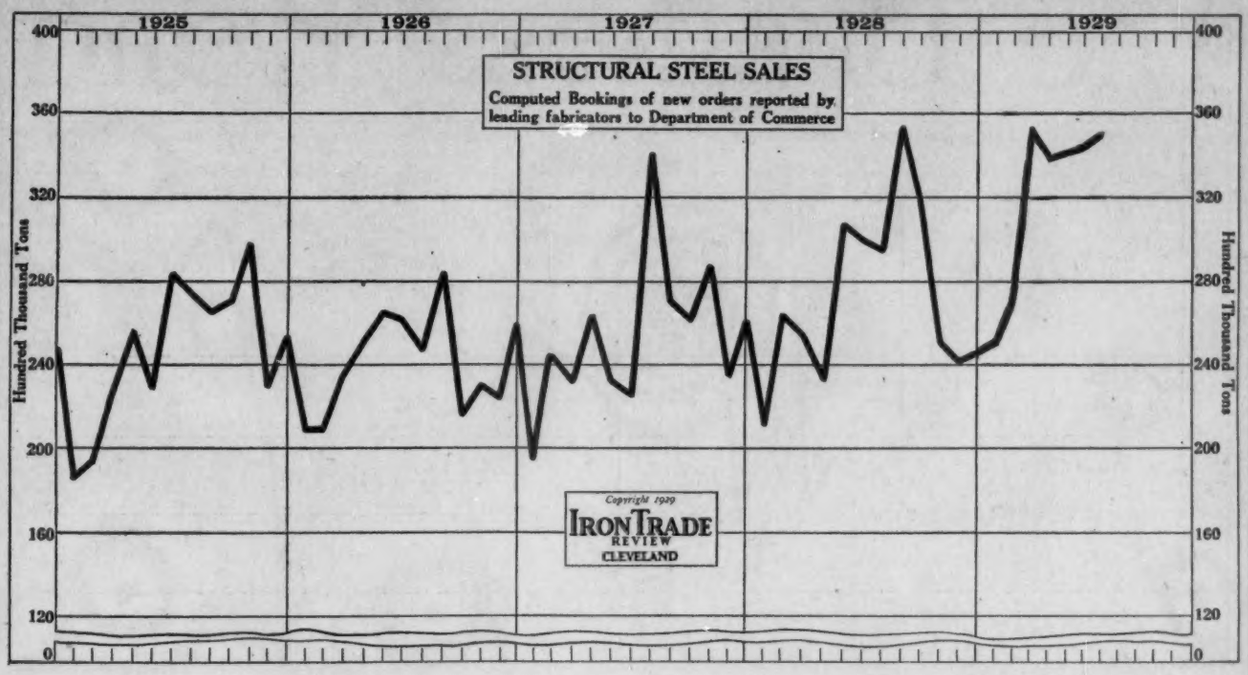
IT NOW seems probable that earlier estimates that 1929 would witness an output of 5,000,000 motor vehicles may be exceeded by actual results. The final total apparently may not be far from 5,500,000, or nearly 1,000,000 more than in 1928. The greater portion of this gain is due to the resumption of large scale output on the part of the Ford Motor Co., which is producing about one-third of all the cars being made.

THE August rate of production for the industry is estimated at about equal to that of July. This is due to some stimulation of production incident to the introduction of new models, which has helped to offset seasonal declines in output on the part of the bulk of the industry.

FOR September lessened activities are expected and indicated by the decreased specifications for steel by motor car manufacturers. Such tendency is logical in view of the heavy production of preceding months. While evidence is lacking of any heavy accumulation of unsold stocks it is not likely that the market will continue throughout the year to absorb cars at the rate of the recent past.

BUSINESS in general is holding at a good level. There has been no summer letdown comparable with other years. Moreover all signs point to a normal quickening of autumn activity in many lines. The credit situation remains uncertain. While it has not as yet had any restraining effect upon trade and industry, some prognosticators believe that this will not be postponed beyond the end of 1929.

The Business Trend

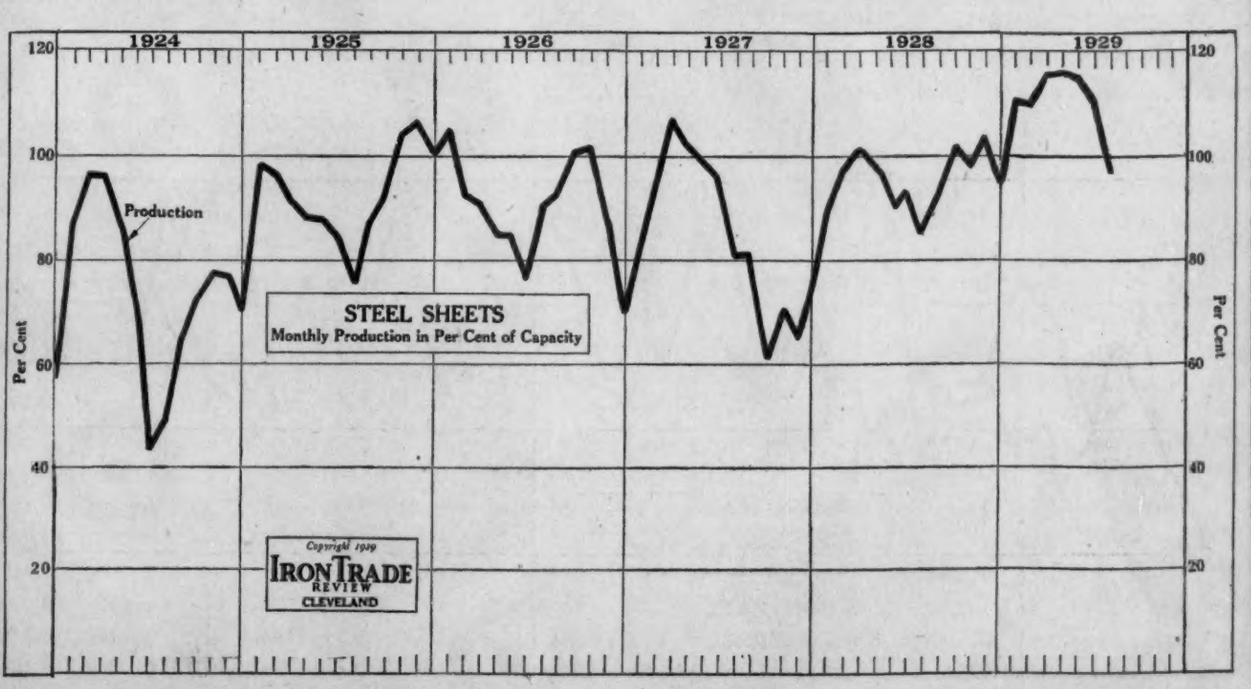


Structural Steel

NEW orders for fabricated structural steel in July were the largest for any month since last March and with that exception, the largest since August, 1928. Computed tonnage of bookings reported by leading manufacturers to the Department of Commerce was 350,350 tons during July compared with 342,650 tons in June and 296,450 in July, 1928. Total bookings for the first seven months of the year amounted to 2,271,500 tons compared with 1,867,250 tons for the corresponding period of 1928.

Steel Sheets

SHRINKING specifications from automobile manufacturers are being reflected in the downward turn of sheet production. In July production of sheets as reported by the National Association of Flat Rolled Steel Manufacturers was 323,905 tons or 98.1 per cent of capacity of mills. This compared with 337,841 tons in July or 110.4 per cent of capacity. Although there has been a decline it is to be noted that operations continue at only a little under capacity in July. Sales increased slightly.



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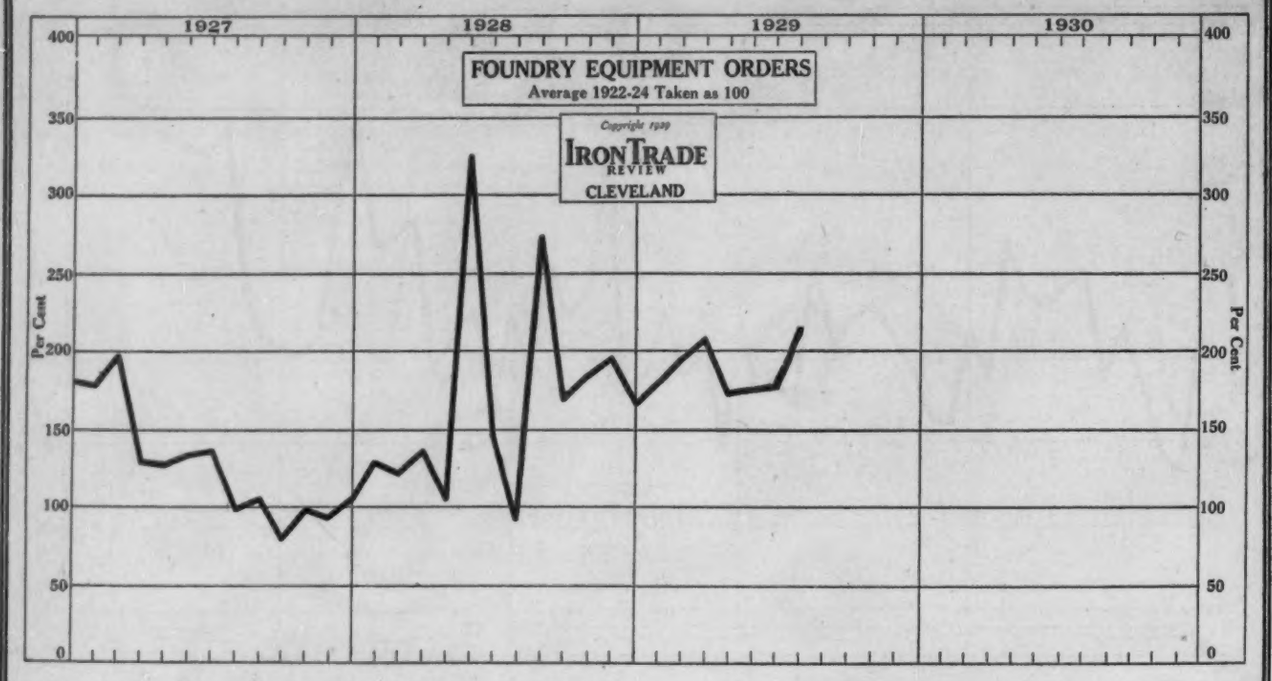
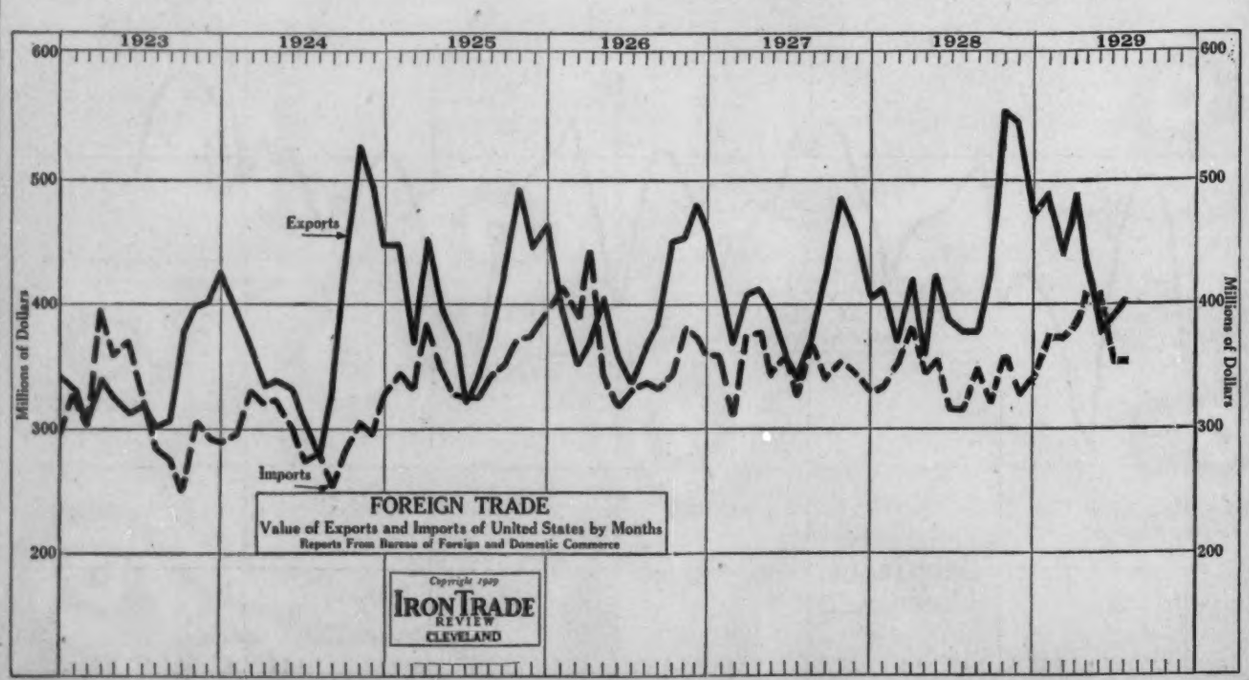


Foundry Equipment

ORDERS for foundry equipment during July showed a sharp gain over the preceding month. They also exceeded the previous high record month for this year in March and stood at the highest point for any July since the Foundry Equipment Manufacturers' association began compiling statistics. The index was 218.6 compared with 177.3 in June and 94.8 in July, 1928. The average for 1922-1924 is taken as 100. Unfilled orders stand at an index of 368.7 indicating a healthy situation.

Foreign Trade

DURING July the valuation of exports and imports of merchandise for this country were the highest for any July since 1920. Exports amounted to $401,000,000 compared with $393,000,000 in June and $378,984,000 in July, 1928. Imports were $353,000,000 for the months compared with $353,400,000 in June and $317,848,000 in July, 1928. The excess of exports in July was $48,000,000 compared with an excess of exports over imports of $61,000,000 in the corresponding month one year ago.



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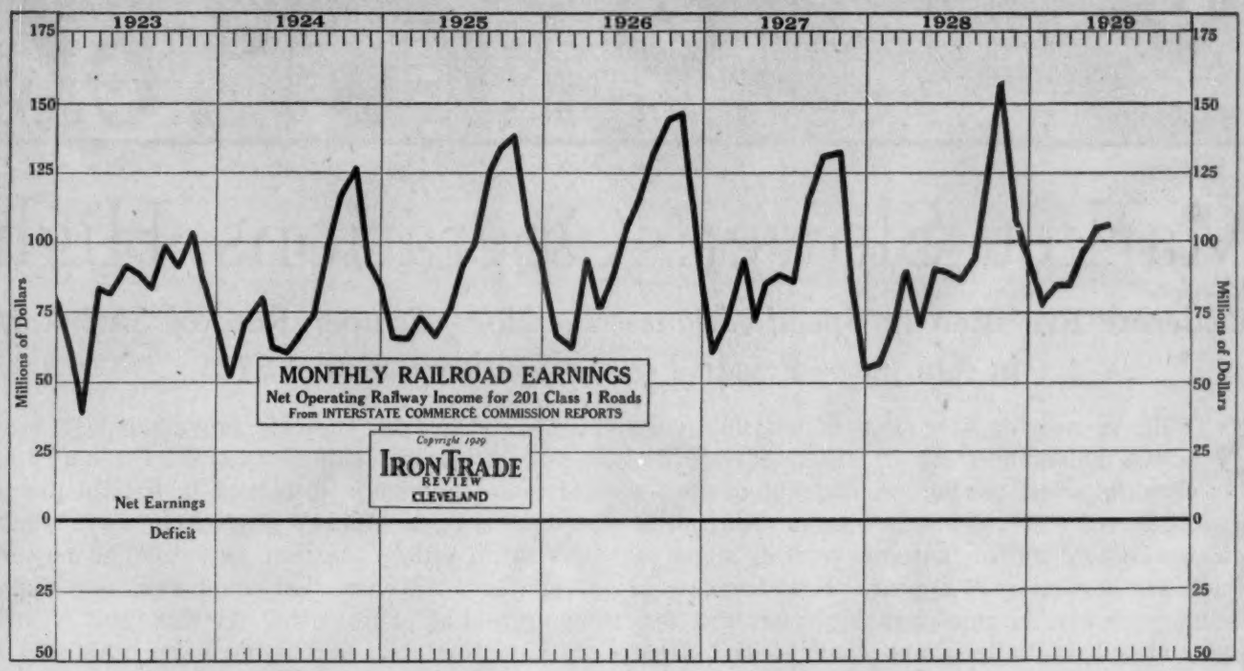
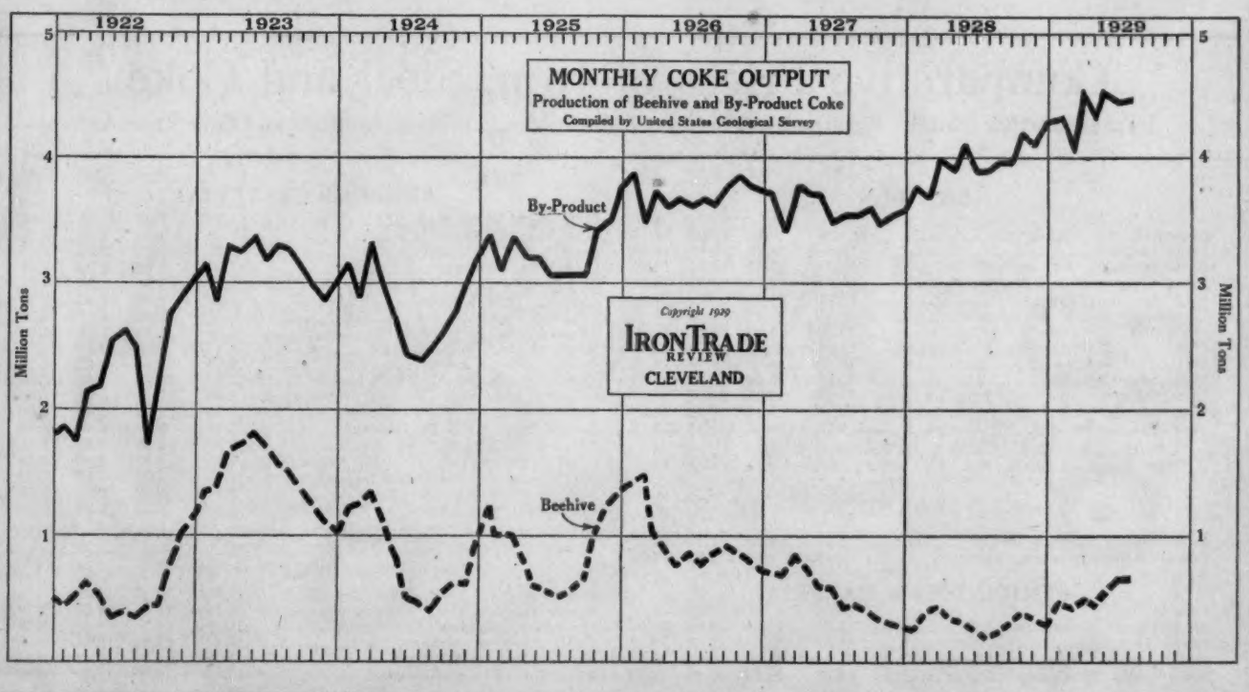


Railroad Earnings

CLASS I railroads for the first six months of 1929 had a net operating income of $563,347,135. This was at the annual rate of return of 5.54 per cent on their property investment. It compares with a net operating income of $462,227,525 or 4.62 per cent on property investment for the first six months of 1928. During June net operating income of the roads was $105,946,086 compared with $103,000,000 in May and with $85,992,000 in June of 1928. Greater efficiency is partly reflected.

Monthly Coke Output

LARGE scale activity in blast furnace production continues to be reflected in the output of coke. Total production of by-product coke for July amounted to 4,613,723 tons, an average of 148,830 tons daily. This was a slight reduction under the daily average for June but it was an increase of 18 per cent over July, 1928. The total production of beehive coke during the month was 600,200 tons, a decrease of 4 per cent compared with June but an increase of 121 per cent over July, 1928.



Market Slower; Operations High

Moderate Recession in Specifications—Backlogs Temper Rate of Shrinkage in Output—Prices Firm—Southern Basic $12

STEEL is nearing the close of an unusually active midsummer season with moderate decline in sales, production and shipments—a breathing space between the peaks attained a few weeks ago and an autumn revival, signs of which are beginning to appear. New business is declining slowly, is relatively high for the season, and substantially above that of the same point in 1928. The general opinion in the trade is that an upturn will appear after the middle of September. With few exceptions, all producers tell of slight recessions in specifications, though production has not declined commensurately, as backlogs have tempered the rate of shrinkage. Prices in general are firm.

Corporation's Operations Stepped Up Slightly

Steelworks operations in the Middle West average 95 to 98 per cent of capacity; in the Pittsburgh district 90 to 95 per cent, and in the Mahoning valley 90 per cent. Steel corporation units this week are operating at 98 per cent, three points higher than the rate prevailing last week.

August pig iron shipments equal those of July, and more interest is displayed in fourth quarter requirements, a number of melters have placed substantial orders for that period. The position of southern furnaces has improved, one maker having sold all of its output for this year. Southern basic and No. 2 foundry have been sold at $12.50, furnace, in competitive districts. A Peoria, Ill., steel company has ordered more than 10,000 tons of southern basic at $12, furnace.

Larger requirements for standard basic iron are expected to develop in northern districts soon. The week's sales of all grades at Cleveland totaled 22,000 tons; in eastern New York 12,000 to 15,000 tons. Demand for Connellsville furnace and foundry coke is quiet. By-product coke prices are being renewed for September.

Sheet Mills Overcome Usual Slack Period

Sheet mills have practically bridged the summer season, usually a slack period, without cessa-

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Aug. 28, 1929	July 1929	May 1929	August 1928
PIG IRON				
Bessemer, del. Pittsburgh	$20.76	20.76	20.56	18.76
Basic, valley	18.50	18.50	18.30	16.00
Basic, eastern, del. eastern Pa.	19.85	19.85	20.50	19.00
No. 2 foundry, del. Pittsburgh	19.76	19.76	20.16	18.26
No.2 foundry, Chicago	20.00	20.00	20.00	17.60
*Southern No. 2, Birmingham	14.00	14.40	15.50	15.65
**No. 2X, Virginia furnace	20.00	20.00	20.75	20.50
**No. 2X, Eastern del. Philadelphia	22.26	22.76	22.76	20.76
Malleable, valley	19.00	19.00	18.80	17.00
Malleable, Chicago	20.00	20.00	20.00	17.60
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
†Gray forge, del. Pittsburgh	19.13	19.13	19.26	18.01
Ferromanganese, del. Pittsburgh	109.79	109.79	109.79	109.79
COKE				
Connellsville furnace, ovens	2.75	2.75	2.75	2.75
Connellsville, foundry, ovens	3.75	3.75	3.75	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	35.00	35.00	36.00	33.00
Sheet bars, open-hearth, Pittsburgh	35.00	35.00	36.00	32.20
Billets, open-hearth, Pittsburgh	35.00	35.00	36.00	32.00
Wire rods, Pittsburgh	42.00	42.00	42.00	42.00

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.
†Now based on Pitts. dist. fur. price; formerly on Valley base.

	Aug. 28, 1929	July 1929	May 1929	August 1928
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.95	1.95	1.95	1.85
Steel bars, Chicago	2.05	2.05	2.05	2.00
Steel bars, Philadelphia	2.27	2.27	2.27	2.17
Iron bars, Chicago	2.05	2.05	2.05	2.00
Shapes, Pittsburgh	1.95	1.95	1.95	1.85
Shapes, Philadelphia	2.06	2.06	2.06	2.01
Shapes, Chicago	2.05	2.05	2.05	2.00
Tank plates, Pittsburgh	1.95	1.95	1.95	1.85
Tank plates, Philadelphia	2.15	2.15	2.15	2.10
Tank plates, Chicago	2.05	2.05	2.05	2.00
Sheets, black, No. 24, Pittsburgh	2.85	2.85	2.95	2.65
*Sheets, blue anl., No. 13, Pittsburgh	2.35	2.35	2.20	2.00
Sheets, gal., No. 24, Pittsburgh	3.50	3.60	3.70	3.50
Sheets, black, No. 24, Chicago	3.10	3.10	3.10	2.80
*Sheets, blue anl., No. 13, Chicago	2.50	2.50	2.35	2.15
Sheets, galvanized, No. 24, Chicago	3.75	3.85	3.85	3.65
**Plain wire, Pittsburgh	2.50	2.50	2.50	2.40
**Wire nails, Pittsburgh	2.55	2.65	2.65	2.55
Tin plate, per base box, Pittsburgh	5.35	5.35	5.35	5.25

*Comparisons for May, 1929 and August, 1928, are with old blue annealed base, No. 10. **To large jobbers.

	Aug. 28, 1929	July 1929	May 1929	August 1928
SCRAP				
Heavy melting steel, Pittsburgh	19.00	18.45	17.85	15.00
Heavy melting steel, eastern Pa.	16.50	16.50	16.25	12.75
Heavy melting steel, Chicago	15.25	14.75	15.45	12.65
No. 1 wrought, eastern Pa.	16.25	16.25	16.25	14.80
No. 1 wrought, Chicago	15.75	14.85	16.40	12.40
Rails for rolling, Chicago	17.75	17.50	17.50	15.00

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND

STEEL PLATES

Pittsburgh, base	1.95c
Philadelphia, del.	2.15c to 2.25c
New York, del.	2.225c to 2.325c
Boston, del.	2.265c to 2.415c
Chicago, base	2.05c to 2.15c
Cleveland, delivered	2.14c
Lackawanna, N. Y., base	2.05c to 2.15c
Birmingham, base	2.10c
Coatesville, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
St. Louis, del.	2.27c
Detroit, del.	2.19c to 2.24c

STRUCTURAL SHAPES

Pittsburgh, base	1.95c
Philadelphia, del.	1.96c to 2.11c
New York, del.	2.195c to 2.245c
Boston, del.	2.265c to 2.415c
Chicago, base	2.05c to 2.15c
Cleveland, delivered	2.09c to 2.14c
Lackawanna, N. Y.	2.05c to 2.15c
Birmingham, base	2.10c
Bethlehem, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	2.19c to 2.24c

BARS

SOFT STEEL

Pittsburgh, base	1.95c
Chicago, base	2.05c to 2.15c
Birmingham, base	2.10c
Lackawanna, N. Y., base	2.05c to 2.15c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.90c to 1.95c
Cleveland, del., outside mills	1.95c
Philadelphia, del.	2.27c to 2.32c
New York, delivered	2.29c to 2.34c
Boston, delivered	2.265c to 2.415c
Detroit, del.	2.19c to 2.24c
Pittsburgh, cold finishing	2.05c
Pittsburgh, forging quality	2.15c

RAIL STEEL

Chicago Heights	1.95c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	2.05c to 2.15c
New York, delivered	2.19c to 2.24c
Philadelphia, delivered	2.17c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet, cut lengths	2.30c
Stock lengths from mill	2.05c
Chicago, billet	2.30c
Chicago, rail steel	1.95c to 2.05c
Chicago, rail steel, road and bridge work	1.95c to 2.05c
Philadelphia, cut lengths	2.57c to 2.62c

SHEETS

SHEET MILL BLACK, NO. 24

Pittsburgh, base	2.85c
Philadelphia, delivered	3.17c to 3.27c
Gary, Indiana Harbor	3.05c
Chicago, delivered	3.10c
Birmingham, base	3.10c
St. Louis, del.	3.27c

TIN MILL BLACK, NO. 28

Pittsburgh, base	3.00c
Gary, base	3.10c

GALVANIZED, NO. 24

Pittsburgh, base	3.50c to 3.60c
Philadelphia, delivered	3.82c to 3.92c
Gary, Indiana Harbor	3.75c to 3.80c
Chicago, delivered	3.80c to 3.85c
Birmingham, base	3.75c
St. Louis, del.	3.92c

BLUE ANNEALED
Sheets, No. 13

Pittsburgh, base	2.35c
Chicago district mills	2.45c
Chicago, delivered	2.50c
St. Louis, delivered	2.67c
Philadelphia, delivered	2.67c
Birmingham	2.50c

Plates, No. 9 and 10

Pittsburgh, base	2.10c to 2.20c
Chicago district mills	2.30c
Chicago, delivered	2.35c
Philadelphia, delivered	2.52c
St. Louis, delivered	2.67c
Birmingham	2.35c

AUTOMOMILE, NO. 20

Pittsburgh, base	4.10c
Detroit, delivered	4.39c

FURNITURE

Pittsburgh	4.20c

(*Turn to the following page*)

tion in the high rate of operations. The inflow of new orders has been unusually steady and heavy. Some automotive manufacturers are ordering sheets for new models. Demands from electrical, radio and electric refrigerator sources are the best for any August in their histories. Sheet mill production may establish a new August record in the Chicago district. Some Pittsburgh mills are unable to meet delivery requirements.

Independent sheet mills of the country increased the daily rate of their sales from 10,264 tons in June to 10,878 tons in July. Production dropped from 11,261 tons in June to 10,448 tons in July, and shipments fell slightly from 11,560 tons to 11,118 tons.

Plate, Rail and Shape Demands Heavy

Plate specifications are diminishing, though sales and specifications in the Middle West still lead the finished steel lines. It now appears a federal loan will be finally authorized to facilitate construction of four private merchant vessels, which will require a total of fully 20,000 tons of plates. Bethlehem Shipbuilding Co. will furnish 6000 tons of steel, mainly plates, for a cruiser recently authorized.

Railmakers at Chicago expect at least 30,000 tons of rails for autumn delivery will be in the market by Sept. 15. There are indications railroad are making budgets earlier for 1930 rail orders. Specifications on contracts are heavy. Carbuilders estimate 10,000 to 12,000 cars will be on inquiry or order by Oct. 15. The Delaware, Lackawanna & Western has placed 1250 freight cars and 141 electric passenger cars. Five hundred, twenty-five freight cars and 350 passenger cars are pending in the East.

Scrap Firm; Composite Market Price Steady

Shape awards in the past week totaled approximately 50,000 tons, including an estimated 20,000 tons for new units of the Illinois Steel Co., at South Chicago and Gary; 8300 tons for the St. Johns bridge, Portland, Oreg., and 3500 tons for a bridge at Rochester, N. Y. Pending business includes 20,000 tons additional for the Illinois Steel units; 15,000 to 20,000 tons for three major building operations in Cincinnati; 2400 tons for Inland Steel Co. plant extension work at Indiana Harbor, Ind., and 3000 tons for a New York Central railroad storehouse, New York city.

Doherty and Texas Oil Co. interests may merge plans for a 250,000-ton steel gas line from Texas to Chicago and Omaha.

Continued slowness in demand for soft steel bars, generally attributed to lack of automotive buying, is reducing backlogs and slowing mill activity. While business has diminished it continues substantially ahead of the volume of last August, and prices are firm. Iron and steel scrap continues strong and railroad accumulations bring relatively high prices. IRON TRADE REVIEW composite of 14 leading iron and steel products is unchanged for the second consecutive week at $36.52.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets Tin Plate, Wire Nails and Black Pipe

This week (August 28, 1929)	$36.52
Last week (August 21, 1929)	36.52
One month ago (July, 1929)	36.71
Three months ago (May, 1929)	37.10
One year ago (August, 1928)	34.96
Ten years ago (August, 1919)	48.27
Fifteen years ago (August, 1914)	22.72

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted On Last Editorial Page—See Preceding Page For Other Products

HOOPS, BANDS, STRIPS

Hot strips, to 6-in., Pitts.	2.00c
Hot strip 6¼ to 24-in., Pitts.	1.90c
Hot strip, bands 6 in. and under, Chicago	2.10c to 2.30c
Do, 6¼ to 24 in.	2.00c to 2.10c
Cooperage stock, Pittsburgh	2.20c
Do, Chicago	2.30c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 ton and over)	2.75c to 2.85c
Worcester, Mass. (3 tons and over)	2.90c to 3.00c

ALLOY STEEL

Hot Rolled
F.o.b. Mills
Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differential	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanadium	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rounds, squares)	0.50	3.15

Hot rolled alloy billets 4 x 4-inch and over take same price per gross ton as same specification alloys bars per net ton. Sizes under 4 x 4 to 2½ in. x 2½ in. inclusive sold on bar basis plus steel bar card extras for size. Sizes under 2½ in. x 2½ in. take bar price on net ton basis.

COLD FINISHED STEEL

Cold finished steel bars drawn or rolled, Pitts., Chi., c.l.	2.30c
Do, del. Detroit	2.575c
Shafting (turned, polished) Pittsburgh	2.30c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.65c to 3.10c
Cold finished steel bars, Cleve.	2.35c

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland, Ironton base

(Per Pound)	Dealer trade	Large jobbers
Bright plain wire, 6 to 9 gage	2.60c	2.50c
Annealed field wire	2.75c	2.65c
Galvanized wire	3.20c	3.10c
Barbed wire, galvanized	3.30c	3.20c
(Per 100-pound keg)		
Wire nails	$2.55	$2.45
Galvanized nails	4.65	4.55
Polished staples	3.10	3.00
Galvanized staples	3.35	3.25
Cement coated nails	2.65	2.55
Manuf. wire, del. Detroit		2.635c
Wire nails, del. Detroit		$2.785

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland-Ironton base on products made there; Duluth $2 higher; Worcester, Mass., Fairfield, Ala., $3 higher.

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

Anderson, Ind., $1 higher, Chicago $2 higher, Duluth, Birmingham $3 higher.

CUT NAILS, CHAIN, PILING

Cut nails, l.c.l., f.o.b. mills	2.70c to 2.75c
Cut nails, l.c.l. f.o.b. mills	2.80c to 2.85c
Chain, 1-in., proof coil, Pitts.	6.25c
Sheet piling, base, Pittsburgh	2.25c

CAST IRON WATER PIPE

Prices per net ton
Class B pipe

Six-inch and over, Birming'm	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six-inch to 24-inch, Chicago	45.20 to 46.20
Six-inch and over, New York	37.50 to 39.50
Four-inch, New York	40.00 to 41.00
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

TIN PLATE TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.35

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.00c to 4.10c

*Price subject to quantity differentials.

WASHERS

Wrought, c.l., Pitts. dist.	$6.50 to 6.75 off
Wrought, c.l., Chicago dist.	$6.702 to 26.90 off
Lock: to dealers	85-5 off
Lock: to consumers	85 off

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 29.00
Light rails, 25 to 45, mills	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.	$43.00

BOLTS AND NUTS

Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.

Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Eagle list	60 to 70 off

MACHINE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Lag screws	60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads	60 to 70 off
Tap bolts	60 to 70 off
Blank bolts	60 to 70 off
Stud bolts without nuts	60 to 70 off

Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 10, 10 and 5 with 2½ off in bulk.

Tire bolts	60-5 off

Nuts

Semifinished	60 to 70 off

HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	5 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

RIVETS

Struc., c.l., Pitts.-Cleve.	3.10c
Structural, c.l. Chicago	3.20c
**7/16-inch and smaller, Pitts.	10 and 10 off
Chi., Cleve.	70 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Raw Materials and Semifinished Products

SEMIFINISHED STEEL

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth	$35.00
Pittsburgh, bessemer	35.00
Youngstown	35.00
Cleveland	35.00
Philadelphia	40.30
Chicago	37.00
Forging, Chicago	42.00
Forging, Pittsburgh	40.00 to 41.00
Forging, Philadelphia	45.30

SHEET BARS

Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00
Chicago	37.00

SLABS

Pitts., Young.	$35.00
Cleveland	35.00

WIRE RODS

Pittsburgh, Cleveland	$42.00
Chicago	43.00

SKELP

All grades, Pittsburgh	1.90c to 1.95c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%	$4.80
Mesabi bessemer, 51½%	4.65
Old range nonbessemer, 51½%	4.65
Mesabi nonbessemer, 51½%	4.50
High phosphorus, 51½%	4.40

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%	8.00
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN ORE
Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese	11.00 to 11.50
North African low phosphorus	12.00 to 12.50
Swedish foundry or basic, 65%, nominal at	9.00 to 10.00
Spanish and North African basic, 50 to 60 per cent	11.50 to 12.00
Newfoundland foundry, 55%	nominal
Tungsten future, short ton unit, duty paid	16.00 to 16.50

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.

Brazilian	34 to 36 cents
Indian	34 to 36 cents
Caucasian, (53-55 per cent)	36 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide., gross ton	$21.00

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK
Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE
Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	40.00

CHROME BRICK
Net Ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	45.00

Pig Iron

Market Active, and Shipments Up to July Rate—Heavy Sales of Southern Iron Reported—Large Basic Orders Expected Soon

BUSINESS in the pig iron market is heavier than the usual seasonal average, and shipments for August are about equal to those of July. More interest is noted in fourth quarter requirements. Heavy sales of southern iron feature the market. A leading southern producer has sold all the iron it can make this year. Sales brought out competitive prices in northern and eastern districts, for while orders for delivery in the Alabama area were booked at $14, base, as low as $12.50 has been done on No. 2 foundry and basic. A Peoria, Ill., melter has closed for more than 10,000 tons of southern basic at $12 a gross ton, furnace. Sales of all grades at Cleveland during the past week totaled 22,000 tons, a substantial portion for fourth quarter.

PITTSBURGH, Aug. 27.—Small lot sales of No. 2 foundry, malleable and basic iron are reported by the majority of furnace interests. One maker sold 2000 to 3000 tons of bessemer iron in the past week. The gray iron melt shows a slight increase. Tonnage demands of all grades of iron are conspicuous by their absence. Large users of basic iron are expected in the market next month, and the basic market is likely to be influenced by the condition of steelmakers' books. Prices are unchanged. Six merchant stacks are active in this district including three Sharpsville, Cherry Valley, Neville Island and Struthers. The only idle merchant stack is the Claire.

Boston, Aug. 27.—Fully 6000 tons of pig iron was sold in the New England district in the past week. Mystic Iron Works booked 2600 tons, 1000 of which was No. 1 and No. 2X for a Worcester machinery manufacturer. Another manufacturer is in the market for 1000 to 2000 tons. Prices are firm. Practically all Buffalo furnaces are getting $18, base, though one stack is reported to have made some slight concessions.

Buffalo, Aug. 27.—New inquiry for pig iron is estimated at 7000 to 10,000 tons, mainly from eastern consumers. Buying is broadening, several lots of 500 to 2000 tons having been placed with district producers for third and fourth quarter delivery. Rumors of a price advance in the East have prompted quick covering of some inquiry, it is thought here. District business is fair. Shipments are larger than they were earlier in the month, although some iron continues to be piled. Prices are steady.

New York, Aug. 27.—Fully 12,000 to 15,000 tons of pig iron has been sold here during the past week, one seller reporting 6900 tons. New inquiry includes 10,000 tons of foundry iron for November and December delivery and 2000 tons of No. 1X and No. 2X for a Massachusetts textile machinery maker for fourth quarter. A New Jersey interest is said to be closing 1000 tons of foundry iron. Prices are unchanged at a range that checks back to $17.50 to $18, Buffalo. While southern offerings continue to exert a depressing influence on prices, northern sellers are encouraged by reports of curtailed production in the South and an advance by one southern maker of 50 cents a ton. Some of the southern foundry iron has recently been offered here at $19.50, tidewater, on 500-ton lots and $20.50 on 200-ton lots. It is reliably estimated that since Aug. 1, when the new rates on southern iron went into effect, approximately a dozen sales have been made, although none involving more than 500 tons. Miscellaneous sales of the past week have included some Dutch iron at $22.75, tidewater, and 150 tons of charcoal iron at $24, base. New York Air Brake closed on 950 tons of foundry and malleable iron for Watertown, N. Y.

Witherbee, Sherman & Co. have blown out their Port Henry blast furnace.

Cleveland, Aug. 27.—Pig iron sales are holding up to the good average established this summer, bookings by furnace interests with headquarters in Cleveland amounting to 22,000 tons in the past week, exceeding the preceding week's orders by 2000 tons. Current shipments are close to the July rate. Sales for fourth quarter delivery are increasing. A nearby melter is inquiring for 500 tons. Prices are firm at $19, base, furnace for local delivery, and $18.50, for outside shipment.

Detroit, Aug. 27.—Stove, radiator and farm implement manufacturers are taking slightly more pig iron than a month ago but automotive foundry requirements on the whole are unchanged at a level considerably below the spring peak. Shipments, however, are somewhat better than a year ago. Outlook is that automotive needs will be considerably lighter in the remaining months of the year than in the opening ones. Malleable and No. 2 foundry iron are $20, lake furnace, or $20.50, delivered Detroit. Southern iron is quoted under the northern delivered price but sales in eastern Michigan have been light.

Chicago, Aug. 27.—Additional quiet closing of northern pig iron tonnage is reported in this market, covering the remainder of the year. More inquiry is appearing from Michigan territory, including overtures from stove and furnace manufacturers. Pig iron deliveries still exceed merchant production in this territory, and furnace interests are maintaining a strong position. The $20 base price is holding steadily for spot and future orders.

One southern furnace which recently advanced its price has withdrawn from the market for the remainder of the year. Several sales of southern

(*Continued on Page* 557)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$19.00
Bessemer, del. Pittsburgh	20.76
Basic, valley furnace	18.50
Basic, Pitts. dist. fur.	19.00
*Basic, del. Pittsburgh	19.63 to 20.13
Basic, Buffalo furnace	18.50
Basic, del. eastern Pa.	19.85 to 20.25
Malleable, valley furnace	19.00
Malleable, Pitts. dist. fur.	19.50
*Malleable, del. Pittsburgh	20.13 to 20.63
Maleable, Cleve. fur. for local del.	19.00
Malleable, Chicago furnace	20.00
Malleable, Buffalo furnace	20.00
Malleable, del. eastern Pa.	21.76 to 22.90
Malleable, Granite City fur.	20.00 to 20.50
No. 1 foundry, Chicago furnace	20.50
No. 1X, Eastern del., Phila.	22.76
No. 1X, Buffalo furnace	21.00
No. 2 foundry, valley furnace	18.50
No. 2 fdy., Pitts. dist. fur.	19.00
*No. 2 foundry, del. Pittsburgh	18.63 to 20.13
No. 2 plain, Buffalo furnace	19.50
No. 2 foundry, Chicago furnace	20.00
No. 2 fdy. Cleve. fur. for local del.	19.00
No. 2 fdy., Granite City	19.50 to 20.00
No. 2 plain, del., Phila	21.76
No. 2 plain, Virginia furnace	19.50
No. 2 plain, Buffalo, del. Boston	22.41 to 22.91
No. 2 plain, N. J., tidewater	20.78 to 21.78
No. 2 Alabama, Bir. base	13.50 to 14.50
No. 2 Tenn., Birmingham base	14.00 to 14.50
No. 2 Tenn., del. Cincinnati	18.19 to 18.69
No. 2 Alabama, del. Cincinnati	17.69 to 18.19
No. 2 Alabama, del., Cleveland	20.51 to 21.01
No. 2 Alabama, del., Chicago	20.01 to 21.01
No. 2 Alabama, del. St. Louis	17.42 to 18.42
No. 2 Ala., Phila., dock dely.	19.75 to 21.01
No. 2 Ala., Balt., dock dely.	19.50 to 20.76
No. 2 Ala., Boston, dock dely.	20.25 to 21.41
No. 2X, east, N. J., tidewater	21.28 to 22.28
No. 2X, eastern, del. Phila.	22.26
No. 2X, foundry, Buffalo furnace	20.00
No. 2X, Buffalo, del. Boston	22.91 to 23.41
No. 2X, Virginia furnace	19.50 to 20.00
Gray forge, Pitts. dist. fur.	18.50
*Gray forge, del. Pittsburgh	19.13 to 19.63
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.26 to 24.76
Low phos., copper bearing fur.	23.00 to 23.50
Charcoal, Superior, del., Chicago	27.04

*Freight from Pittsburgh district furnace to points in Pittsburgh district 63c, 76c and $1.13 per ton.

CANADIAN PRICES

No. 1 foundry, del. Toronto	$24.60
No. 1 foundry, del. Montreal	26.00
No. 2 foundry, del. Toronto	24.10
No. 2 foundry, del. Montreal	25.50
Malleable, del. Toronto	24.60
Malleable, del. Montreal	26.00
Basic, del. Montreal	24.50

Silvery iron Jackson county, O., furnaces in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$41; 16—$43.50; 17—$46.50.

Coke

Market Is Quiet, and Prices Steady—Some Suspensions of Shipments by Steelworks Noted

DEMAND for beehive foundry coke is dull, in contrast with heavier shipments several weeks ago. Prices are being renewed at unchanged levels for September delivery. Larger requirements are appearing for domestic grades, which tend to stabilize the market. Some recent suspensions of shipments of beehive furnace coke by steelworks are noted.

Pittsburgh, Aug. 27.—Standard furnace coke usually sells at $2.75, though small sales are made occasionally at $2.65. Single carloads sometimes bring $2.85. General conditions are quiet and unchanged. Some recent suspensions by steelworks leave a few producers uncertain. Medium sulphur coke is offered at 10 to 15 cents under the usual market. Foundry coke demand is dull, and prices are unchanged at $3.75 to $4.85.

Production of coke in the Connellsville region for the week ended Aug. 17 was 96,725 tons, against 96,850 tons the preceding week and 29,640 tons a year ago.

Boston, Aug. 27.—Demand for foundry coke is fairly active. Prices are steady.

New York, Aug. 27.—Further improvement is noted in demand for furnace coke with the market generally established at $2.75, ovens. Foundry coke is steady at $3.75 to $4.85, Connellsville, and by-products foundry coke at $9 to $9.40, delivered Newark, $11 delivered New England points; and $9 delivered Philadelphia.

Cincinnati, Aug. 27.—Prices on all grades of domestic by-product coke will be advanced 25 cents a ton for delivery in the Cincinnati district Sept. 1. Specifications for by-product foundry coke have been good throughout August with new business slightly below July. Prices on by-product foundry coke will remain at about $10.05, for delivery in Cincinnati, for September.

Detroit, Aug. 27.—By-product coke is moving a trifle more freely to foundries, as stove, furnace and radiator plants start on their fall runs. Automotive foundries are maintaining their July rate of shipments. By-product foundry coke is $9, Detroit ovens, or $9.50, delivered Detroit.

St. Louis, Aug. 27.—Demand for metallurgical coke holds up better than the average for this time in the past five years. Shipments of foundry grades by the by-product interest since Aug. 1 are about the same average daily rate as during July, and considerably ahead of August, 1928. Prices are unchanged.

Birmingham, Ala., Aug. 27.—Foundry coke is moving steadily, and demand warrants active operation at by-product ovens. Inquiries indicate good business the remainder of the year. Prices are steady.

Coke Prices

Prices per Net Ton

Beehive Ovens	
Connellsville furnace	$2.75
Connellsville foundry	3.75 to 4.85
New River foundry	6.00 to 6.50
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.75
By-Product Foundry	
Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England del.	11.00
St. Louis del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit, ovens	9.00
Philadelphia, del.	9.00

Ferroalloys

Specifications Hold to High Level—Prices Firm

New York, Aug. 27.—Steadiness prevails in spiegeleisen. One larger seller reports monthly sales over the last three or four months have not varied 300 tons a month. Domestic spiegeleisen, 19 to 21 per cent, is unchanged at $34, furnace, and English, 26 to 28 per cent nominally $36.50, duty paid, tidewater. Specifications are steady in ferromanganese, which is quoted at $105, duty paid. Tungsten is in a quiet market but prices are unchanged. Future wolframite might be had a share less than $16 a short ton unit, duty paid, though this is the general asking price except for the price of $16.50 on domestic scheelite. Special ferroalloys are unchanged but firm.

Bolts, Nuts, Rivets

Fourth Quarter Contracts Expected to Be at Present Prices

NUT AND BOLT PRICES, PAGE 542

Chicago, Aug. 27.—Producers of bolts, nuts and rivets will begin sending out contract forms early next month to customers in their more extended western territory. The rate of specifications is unchanged at slightly under July and about the same as a year ago. It is indicated that present quotations will be extended for fourth quarter.

Cleveland, Aug. 27.—Nut, bolt and rivet operations are on a 70 to 75 per cent average basis. While there has been some shrinkage of automotive demand, other consuming lines have held up well and jobber demand has been more or less steady. Some automotive users are commencing to come back and by September, makers hope for a real resumption of specifying. Prices are fairly firm.

Philadelphia, Aug. 27.—Demand for bolts and nuts is fair with rivet demand slow. Bolts and nuts are firm at published discounts and rivets at 3.10c, base, Pittsburgh. New York Shipbuilding Co. is expected to place a large tonnage of each for five ships it has booked.

Breaks Ground for New Beam Mill

Chicago, Aug. 27.—Ground is being broken for the construction by the Illinois Steel Co. of the new structural beam mill authorized recently for its South Chicago works.

The American Bridge Co. has been awarded the contract for fabricating the steel. The work will be distributed among the American Bridge Co. plants in the Chicago district, and this, with the other Illinois Steel Co. expansion work in this district, will keep that fabricator partly or fully occupied for many months.

The beam mill, which will produce wide flange structural sections, is a part of the expansion program announced by the Illinois Steel Co. July 3, which is expected to add approximately 1,500,000 tons to the annual steel producing capacity in the Chicago district. The whole program also includes 14 open-hearth furnaces, blooming and slabbing mills and two plate mills. It is understood the plate mills will be located at the Gary works.

Ferroalloy Prices

(In dollars, except ferrochrome)

Ferromanganese, 78 to 82 per cent, tidewater, duty paid	$105.00
Ferromanganese, del. Pittsburgh	109.79
Spiegeleisen, 19 to 21 per cent, domestic furnace, spot†	32.00 to 34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.45 to 1.50
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producer's plant, net ton	160.00
Do., one ton to carload	170.00
Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Quantity diff. apply on 100 tons and over.
*These prices contract, spot $5 higher.

Scrap

Strength Continues in All Centers—Tonnage Sales in East Are at High Level

HIGH prices realized on railroad tonnages at Chicago and tonnage purchases by Bethlehem Steel Co. in the east at unimpaired delivered price are high signs of strength in the scrap market. Supplies are short and dealers find difficulty in filling contracts at a profit.

Chicago, Aug. 27.—A decidedly stronger tone is being shown in iron and steel scrap. Somewhat lighter railroad and industrial offerings, active short covering and steady consumer shipments are contributing to strength. Railroad scrap bids have risen to an unusual mark. As only part of the scrap offered last week by the Rock Island and Burlington roads entered the Chicago market, not all of those prices gage conditions, but some of the Burlington's melting steel was bought for local delivery at $16.80, gross, delivered. Moderate sales of melting steel are being made to steelworks consumers at $15.75, and the range of $15.25 to $15.75 prevails. Rock Island's rolled steel car wheels sold at $19.40, on track, or nearly $20, delivered in the Chicago switching district. Several sellers are holding cast borings at $11. Rail crops, both 2 and 3-foot, have advanced 50 cents to $1 a ton.

Boston, Aug. 27.—Lack of material is the main stumbling block in the scrap market. Whether sellers are without supplies or are holding off in the prospect of higher prices is a question, but the fact remains that

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 13.50
Boston, dealers	12.25 to 12.75
Boston, No. 2	10.00 to 10.50
Buffalo, No. 1	16.50 to 18.00
Buffalo, No. 2	14.75 to 15.00
Chicago	15.25 to 15.75
Cincinnati, deal.	14.25 to 14.75
Cleveland, No. 1	16.50 to 17.00
Cleveland, No. 2	14.25 to 14.75
Detroit, No. 1 deal.	14.50 to 15.00
Detroit, No. 2 deal.	11.50 to 12.00
East Pa., del. mill	17.00
N. Y., deal. R. R.	12.50 to 13.35
N. Y., deal. yd.	8.25 to 9.25
Pittsburgh, No. 1	19.00 to 19.50
St. Louis, No. 1	14.75 to 15.25
Valleys, No. 1	18.50 to 19.00

COMPRESSED SHEETS

Buffalo (dealers)	14.75 to 15.00
Chicago	13.50 to 14.00
Cleveland	15.75 t o16.25
Detroit, dealers	14.00 to 14.50
E. Pa. new mat.	16.00
Pittsburgh	18.50 to 19.00
Valleys	18.00 to 18.50

BUNDLED SHEETS

Buffalo	12.00 to 12.50
Cincinnati, deal.	11.25 to 11.75
Cleveland	12.50 to 13.00
Eastern Pa.	11.50
Pittsburgh	16.50 to 17.00
St. Louis	10.50 to 11.00

SHEET CLIPPINGS LOOSE

Chicago	8.75 to 9.25
Cincinnati	9.00 to 9.50
Detroit, dealers	9.50 to 10.00
St. Louis	10.50 to 11.00

STEEL RAILS, SHORT

Birmingham	14.00 to 15.00
Boston	10.50 to 12.50
Buffalo	19.25 to 19.75
Chicago (3 feet)	19.00 to 19.50
Chicago, 2 ft. and under	19.50 to 20.00
Cincinnati, deal.	18.50 to 19.00
Detroit, dealers	17.00 to 17.50
Pittsburgh (3 ft.)	20.00 to 21.00
Pittsburgh, 2 ft. and under	21.00 to 22.00
St. Louis	18.00 to 18.50

STOVE PLATE

Birmingham	12.50 to 13.00
Boston consumers	11.00 to 11.50
Buffalo	12.75 to 13.25
Chicago, net	11.50 to 12.00
Cinn., deal., net	9.25 to 9.75
Detroit, net. deal.	9.50 to 10.00
Eastern Pa.	12.00
N. Y., deal., mill	8.00 to 8.50
St. Louis	12.50 to 13.00

COUPLERS, SPRINGS

Buffalo	19.25 to 19.75
Chicago	17.00 to 17.50
Eastern Pa.	21.50
Pittsburgh	22.00 to 22.50
St. Louis	15.75 to 16.25

ANGLE BARS—STEEL

Chicago	17.25 to 17.75
St. Louis	15.25 to 15.75

LOW PHOSPHORUS

Buffalo, billets and bloom crops	19.50 to 20.00
Cleve. billet and bloom crops	17.50 to 18.00
Eastern Pa.	21.00 to 22.00
Pitts. billet and bloom crops	23.00 to 24.00
Pitts., sheet bar crops	22.00 to 22.50

FROGS, SWITCHES, GUARDS

Chicago	16.25 to 16.75
St. Louis	17.00 to 17.50

SHOVELING STEEL

Chicago	15.25 to 15.75
Cleveland	11.75 to 12.25
Detroit, dealers	9.00 to 9.50
St. Louis	14.75 to 15.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.00 to 11.00
Boston, dealers	11.00 to 11.50
Buffalo, No. 1	13.50 to 14.00
Buffalo, No. 2	16.00 to 16.50
Chicago, No. 1	15.75 to 16.25
Chicago, No. 2	15.25 to 15.75
Cinn., No. 2	14.25 to 14.75
Eastern Pa.	16.00 to 16.50
N. Y., No. 1 deal.	12.00 to 12.50
Pittsburgh, No. 2	19.00 to 19.50
St. Louis, No. 1	13.75 to 14.25
St. Louis, No. 2	15.00 to 15.50

SPECIFICATION PIPE

Boston	9.75 to 10.00
Eastern Pa.	15.00
New York, deal.	10.25 to 10.75

BUSHELING

Buffalo, No. 1	14.75 to 15.00
Chicago, No. 1	13.25 to 13.75
Cinn., No. 1 deal.	11.00 to 11.25
Cinn., No. 2	7.00 to 7.50
Cleveland, No. 1	14.50 to 15.00
Cleveland, No. 2	10.50 to 11.00
Detroit, No. 1 deal.	13.00 to 13.50
St. Louis, No. 1	10.00 to 10.50
Valleys, new No. 1	16.00 to 16.50

MACHINE SHOP TURNINGS

Birmingham	7.00 to 8.00
Boston	7.00 to 7.50
Buffalo	9.00 to 9.50
Chicago	7.50 to 8.00
Cincinnati, deal.	8.50 to 9.00
Cleveland	9.75 to 10.25
Detroit	8.75 to 9.25
Eastern Pa.	12.50
New York, deal.	7.50 to 8.00
Pittsburgh	12.50 to 13.50
St. Louis	7.50 to 8.00
Valleys	11.00 to 11.25

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	6.00 to 6.25
Buffalo	12.00 to 12.50
Cincinnati, deal.	9.25 to 9.75
Cleveland	10.50 to 11.00
Detroit, dealers	9.75 to 10.25
Eastern Pa.	11.00
New York, deal.	7.00 to 7.25
Pittsburgh	12.50 to 13.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	7.00 to 8.00
Boston chem.	9.75 to 10.00
Boston, dealers	6.50 to 6.75
Buffalo	12.00 to 12.50
Chicago	10.25 to 10.75
Cincinnati, deal.	9.25 to 9.75
Cleveland	10.50 to 11.00
Detroit, dealers	8.75 to 9.25
Eastern Pa.	11.50
Eastern Pa., chem.	14.50
New York, deal.	7.00 to 7.75
Pittsburgh	12.50 to 13.00
St. Louis	9.50 to 10.00

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	12.25 to 12.75
Chicago, net	11.50 to 12.00
Cincinnati	10.00 to 10.50
Eastern Pa.	12.00 to 12.50
New York, deal.	8.75 to 9.25
St. Louis	13.00 to 13.50

FORGE FLASHINGS

Boston dealers	10.50 to 10.75
Buffalo	13.75 to 14.25
Cleve. over 10 in.	13.50 to 14.00
Detroit	13.00 to 13.50

FORGE SCRAP

Boston, dealers	9.00 to 9.25
Chicago	18.00 to 18.50
Eastern Pa.	14.00

ARCH BARS AND TRANSOMS

Chicago, net	21.00 to 21.50
St. Louis	21.50 to 22.00

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	14.25 to 14.75
Chicago, steelworks	12.50 to 13.00
Cleveland	14.00 to 14.50
Eastern Pa.	15.00
Pittsburgh	16.50 to 17.00
St. Louis	10.00 to 10.50

STEEL CAR AXLES

Birmingham	17.00 to 18.00
Boston, ship point	18.00 to 18.50
Buffalo	19.50 to 20.00
Chicago	19.05 to 19.60
Eastern Pa.	23.00 to 23.50
Pittsburgh	21.00 to 22.00
St. Louis	19.50 to 20.00

SHAFTING

Boston, ship point	14.00 to 14.75
Chicago	17.35 to 17.90
Eastern Pa.	19.00 to 20.00
New York, deal.	14.00 to 14.50
St. Louis	18.50 to 19.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	11.50 to 12.50
Boston, iron	14.00 to 14.50
Buffalo, iron	14.00 to 14.50
Buffalo, steel	19.25 to 19.75
Chicago, iron	14.00 to 14.50
Chi., rolled steel	18.50 to 19.00
Cincinnati	12.50 to 13.00
Eastern Pa. cast.	16.50 to 17.00
Eastern Pa., rolled	20.50 to 21.50
N. Y., iron, deal	12.00 to 12.50
Pittsburgh, iron	16.50 to 17.00
Pittsburgh, steel	22.00 to 22.50
St. Louis, iron	15.00 to 15.50
St. Louis, steel	18.50 to 19.00

No. 1 CAST SCRAP

Birmingham, cup.	13.00 to 14.00
Buffalo	15.75 to 16.25
Boston, textile	14.00 to 14.50
Chicago, mach.	16.25 to 16.80
Chicago, railroad	15.10 to 15.65
Chicago, agri.	14.50 to 15.00
Cincinnati, Mach. cupolas, gross	19.00 to 19.50
Cleveland, cupola	15.75 to 16.25
Detroit, net, deal.	12.00 to 12.50
East Pa., cupola	17.00
N. Y., cup., deal.	12.50 to 13.00
N. Y., del. local foundries	17.00
Pittsburgh, cupola	15.00 to 16.00
San. Fran., del.	13.50 to 14.00
Seattle	14.50 to 14.75
St. L. No. 1 mach.	15.25 to 15.75
St. Louis, No. 1	14.50 to 15.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	12.75 to 13.25
Cleve., breakable	12.50 to 12.75
Detroit, auto, net dealers	12.00 to 13.00
Detroit, break. deal	9.00 to 9.50
Eastern Pa.	15.00
New York, deal.	11.50 to 12.00
Pittsburgh	13.00 to 13.50

MALLEABLE

Boston, railroad	18.50 to 19.00
Buffalo	18.00 to 18.50
Chicago, agri.	15.50 to 16.00
Chicago, railroad	17.00 to 17.50
Cinn., R. R., deal	15.25 to 15.75
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail.	17.50 to 18.00
Detroit auto deal.	15.25 to 15.75
St. Louis, rail	15.50 to 16.00

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	13.50 to 14.50
Boston	13.00 to 13.50
Buffalo	16.50 to 17.00
Chicago	17.75 to 18.25
Eastern Pa.	18.00 to 18.50
New York	12.75 to 13.25
St. Louis	17.25 to 17.75

LOCOMOTIVE TIRES

Chicago, cut	18.50 to 19.00
St. Louis, No. 1	15.00 to 15.50

LOW PHOS. PUNCHINGS

Chicago	16.75 to 17.25
Pittsburgh	20.50 to 21.50

brokers and dealers are not in a position to meet the developing demand that has made its appearance. Prices are firm.

New York, Aug. 27.—Buying of 40,000 to 50,000 tons of railroad scrap by Bethlehem Steel Co. at $16.50, delivered, marks an otherwise dull week here. Wrought and cast scrap are moving particularly slowly. Dealers' buying prices are unchanged.

Buffalo, Aug. 27.—Dealers report a growing shortage of No. 1 heavy melting steel, with pressure for deliveries coming from recent buyers. Offers as high as $17.75 have been made by dealers for tonnage to deliver to district melters, it is said. Large tonnage of No. 2 heavy melting steel is being moved at $14.75, through brokers. Blast furnace scrap has advanced to a top of $12.50, sellers report. Short steel rail sales have been made at $19.50. Malleable has declined to $18.50 and has been sold in fair tonnage at this price.

Philadelphia, Aug. 27.—Bethlehem steel Co. has purchased 40,000 to 50,000 tons of No. 1 heavy melting steel. The price is $16.50 a ton, delivered at Bethlehem, Coatesville and Steelton, Pa.

Pittsburgh, Aug. 27.—Iron and steel scrap is quiet but strong and prices are unchanged. Dealers expect buying to be resumed between Labor day and Sept. 15. A steelmaker recently closed for 20,000 tons of No. 1 melting steel at prices ranging from $19.50 to $20. This is for highest specification steel while ordinary steel brings $19 to $19.50. Steel specialties have sold up to $22.50. Less scrap is moving from Detroit. The Valley market appears quieter. Offerings are readily absorbed. The Pennsylvania list of 60,000 tons will close Sept. 4, including 10,000 tons of melting steel and 13,000 tons of rails.

Cleveland, Aug. 27.—No. 1 heavy melting steel is bringing $16.50 to $17 with some buying reported at $17.25. The lighter grade material for the leading consumer is at $15.25 to $15.75 with $15.50 the most generally accepted. No. 2 melting steel is quotably unchanged at $14.25 to $14.75, although some dealers report purchases at $15. Machine shop turnings are holding at $9.75 to $10.25. Blast furnace grades are somewhat easier and several purchases are reported at $10.50. Dealers here are buying actively for shipment against contracts but are little inclined to accumulate stocks because of the uncertain condition of the market. Two mills are taking steel scrap in good tonnage. The third is specifying actively for steel although maintaining its system of regulation.

Cincinnati, Aug. 27.—Demand for heavy melting steel continued strong although new buying was quiet. Prices remained firm excepting in cast iron grades in which little activity was reported.

Detroit, Aug. 27.—While iron and steel scrap continues generally strong, it lacks the buoyancy of a few weeks ago. Machine shop turnings have sold up to $9.50, but $9 to $9.25 now seems the top. Heavy melting steel has not brought over $15. The cast grades are a shade weaker, No. 1 being down to $12 to $12.50, net. Production of scrap in this district is slightly smaller, but dealers and melters out of the district are less in need of material.

St. Louis, Aug. 27.—Iron and steel scrap continue strong, with heavy melting steel and specialties still leading the demand. Material in this grade is scarce, and dealers owing it on contracts are experiencing difficulty in obtaining tonnages for delivery.

Dealers' quotations are firm, but the only actual changes the past few days were upward revisions to the extent of 50 cents per ton on steel angle bars, steel car axles and railroad malleable. Malleable grades generally are in better demand and stronger than a few weeks back.

Birmingham, Ala., Aug. 27.—Steel scrap continues active with heavy melting steel firm at $13.50 for best quality. Iron items are slow.

Toronto, Ont., Aug. 27.—The Canadian iron and steel scrap markets are gradually coming out of the summer slump and business is now touching steadily higher levels. While there was little change in the demand for steel scrap during the week, iron grades are moving in larger tonnage and some large orders are in prospect for early closing. Prices are unchanged.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron Axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	15.00
Iron axles	17.00
Heavy melting steel	9.50
Turnings	7.50
No. 1 mach. cast (net)	16.00
Malleable (net)	12.50

Semifinished Steel

Shipments Equal July Rate—Inquiry Is Light

SEMIFINISHED STEEL PRICES, PAGE 542

Pittsburgh, Aug. 27.—Open inquiry for sheet bars, billets and most semifinished products is light as users now have their needs fully met from usual sources of supply. Shipments to users are substantially as large as in July and are as heavy as in any August. Occasional "feelers" for fourth quarter material are out out but no sales are reported. Billets, blooms and sheet bars are $35, Pittsburgh. Wire rods are firm at $42, Pittsburgh.

Youngstown, O., Aug. 27.—Since consumers of finished steel are beginning to place with the mills contracts for fourth quarter needs, it appears likely that consumers of semifinished materials also will begin to negotiate shortly for their fourth quarter requirements. These usually are placed with producers two to four weeks before the quarter actually begins. Revival of independent sheet mill activity in the Valley district this week and continued capacity operations of strip mills here have resulted in renewed satisfactory shipments of sheet bars and billets to nonintegrated mills. There has been some revival of talk that the Republic Iron & Steel Co. may build four additional open-hearth furnaces at its Warren, O., works, formerly the Trumbull plant, where it has been short of steel for some time. If these furnaces are built, that would give the company 12 open hearths at Trumbull works. Billets, slabs and sheet bars all are firm at $35, Pittsburgh and Youngstown, while wire rods are also firm at $42, Pittsburgh and Cleveland.

Operating Rates

Pittsburgh 90 to 95, Chicago 95 to 98, Valley 90

Pittsburgh—Steelmaking operations are receding slightly as specifications for most finished steel lines decline, but the shrinkage in operating rates is tempered by fairly heavy backlogs. Steel ingot operations here average 90 to 95 per cent. Tin plate operations are 85 to 90 per cent. Sheet mills are operating from 90 per cent to capacity.

Chicago—Steel ingot production for this district is estimated at 95 to 98 per cent. An independent steelworks has been obliged to make considerable open-hearth furnace repairs. Bar and structural mills are slightly under capacity, while plate mills are in full operation. Rail mill operations are expected to hold at 75 per cent for at least 30 days. Sheet mill operations are 80 to 85 per cent. Twenty-nine of the 36 steelworks blast furnaces in the district are active.

Youngstown, O.—Final week of August finds Valley steelworks operations the best of any preceding period in this month. The average rate of operations here today is around 90 per cent. Shipments continue satisfactory in most lines of manufacture. Further change in operations for the better is expected to follow Labor Day. The independents have added two open-hearth furnaces to the active list, making 46 active out of 51. Steel corporation subsidiaries are at 90 per cent. Bar mill operations are not so good with independents who are about 70 per cent active, with Carnegie Steel Co. about 90 per cent. Independent sheet mill schedules are much improved this week, the Niles works disabled last week resuming Monday in full, making 113 units active out of 120. Strip production continues at capacity and independent tin mills are 85 per cent active, but are tapering off as the end of the canning season approaches. The Girard puddling mill is 60 per cent active.

Bars

Sales and Specifications Less Than Recent Weeks—Bottom of Decline Thought Reached

DECREASED activity in buying and specifying soft steel bars is attributed largely to relatively small demand from automotive consumers, a condition expected to right itself as autumn approaches. Slackness, however, is only relative and an excellent volume of business continues, greater than that of last August. Prices continue firm.

BAR PRICES, PAGE 541

Chicago, Aug. 27.—Sales and specifications in bar mill products, as in other heavy finished steel, have declined compared with the steady high rate of recent months, but the volume of mill orders is sufficient to keep departments operating at or near capacity. Difference of opinion exists as to probable operations next month, but a fall bulge in steel tonnage is confidently expected. Bar deliveries now are three to seven weeks. Several large parts manufacturers are consuming at a relatively higher rate than the average activity of automotive builders. Western tractor works are expected to resume full stride by Oct. 1. Shipments of bars to jobbers and reinforcing warehouses are steady. One producer of finished steel expects his August ingot production to set a record.

Western alloy steel bar mill operations are estimated at 85 to 90 per cent as a group. Prices are unchanged. Soft steel bars are quoted 2.05c to 2.15c, Chicago.

New York, Aug. 27.—Demand for steel bars is less active, although pressure for early delivery continues. Most mills are offering around three weeks on the more common specifications, with somewhat better deliveries available in some instances. Prices hold at 1.95c, Pittsburgh, minimum.

Philadelphia, Aug. 27.—Iron bar demand continues good. Prices are firm at 1.85c to 1.95c, Pittsburgh. Steel bar demand has improved and current bookings are almost equal to the June and July rate. Bar prices are firm at 1.95c to 2.00c, base, Pittsburgh.

Pittsburgh, Aug. 27.—Specifications for soft steel bars continue to decline gently and are at the lowest point of the quarter. Nevertheless, they represent a fair increase over last August, and backlogs and prospective tonnage assure makers of good business over the remainder of the year. Automotive needs for bars have slumped rather sharply but makers look for a comeback the middle of September in anticipation of higher automobile production in October. Cold bar finishers are specifying lighter, reflecting the automotive situation. One maker reports August shipments equal to July but this has been at the expense of backlogs. Another independent maker has experienced a slight upturn in the past week, but this is contrary to the general experience. Soft steel bars are 1.95c, Pittsburgh.

Detroit, Aug. 27.—Contrary to the precedent set in almost every previous month this year, specifications for soft steel bars are not expanding as the month closes. Demand is lighter than in the opening ten days of August. Some makers, like Buick, had specified prematurely. Others have been more conservative in their schedules. Ford continues a brisk buyer. Larger crankshafts in most new models make for an increase in forging bar tonnage. Bar sellers believe requirements the remainder of the year will be slim compared with the opening months. Soft steel bars are 1.95c, Pittsburgh, except by Cleveland makers, who quote 1.90c, Cleveland. One Cleveland seller is maintaining weekly bar shipments by water to Toledo.

Shelby Stacks Wrecked

Birmingham, Ala., Aug. 27.—Demolition of the two old charcoal iron blast furnace stacks at Shelby, Ala., formerly property of the Shelby Iron Co., is soon to be completed, the greater portion of the material going to scrap yards. Some of the machinery was removed.

The United Kingdom supplies about 80 per cent of metalworking tools imported by India, the United States and Germany furnishing 10 and 8 per cent respectively.

Plates

Backlogs Reduced as Operations Hold to High Level—Improvement in Volume of New Orders

PLATE mills continue shipping at the average high rate of July, reducing backlogs, as new orders are diminishing in volume. Plate sales and specifications still lead finished steel products in the Middle West. The Milwaukee fabricator has purchased additional tonnage in the East for pipe line tonnage. Orders from car shops are substantial. Prices are steady.

PLATE PRICES, PAGE 541

Chicago, Aug. 27.—Plates continue to lead finished steel products in sales and specifications, although orders have dropped off from recent weeks. Oil tank, pipe line, car shop, and boiler and heating plant tonnage is being added to mill books. Deliveries now are from four to six weeks on some sections, and orders are being added regularly to current rolling schedules. A. O. Smith Corp., Milwaukee, has purchased additional plates in the East for pipe line tonnage. No announcement has been made as to when material for the second unit of the Empire Oil & Refining Co.'s $10,000,000 refinery at East Chicago, Ind., will be bought. Local fabricators closed on 3000 tons of tank plates for the Southwest, and about 2500 tons has come out in fresh inquiry. One fabricator in this district is specifying about 250 tons weekly for tank work. Car shop orders from several builders are substantial. The base price is holding at 2.05c, Chicago.

Philadelphia, Aug. 27.—The Export Steamship Corp., after arranging finances with the shipping board last week, has placed four combination passenger and freight boats with the New York Shipbuilding Co. A contract has been booked by the latter for one cruiser, and the Bethlehem Steel Co. will furnish 6000 tons of steel. The Philadelphia navy yard has purchased a round tonnage of plates, shapes and bars for reconditioning the battleship ARIZONA. The navy yard is taking bids for reconditioning the battleship PENNSYLVANIA, and a considerable tonnage of plates, shapes and bars will be required.

Miscellaneous plate demands are more active. Prices continue firm at 2.10c to 2.15c, base, Coatesville.

Pittsburgh, Aug. 27.—The total of plate requirements for pipe lines, barges and freight cars is sufficient to keep some makers six to eight weeks behind in deliveries on heavy plates. Mills are shipping in August a tonnage substantially equal to July but in some cases this has involved a reduction of backlogs. Beginning the middle of September, makers look for improved demand. No barge inquiries of size are current. A number of steel pipe line projects are in the pending stage but none is near placement. Plates are 1.95c, Pittsburgh.

New York, Aug. 27.—While less active, a good volume of plate business is being closed, with delivery in three

to four weeks. The virtual sanctioning by President Hoover's interdepartmental board of a $6,900,000 federal loan to facilitate private construction of four merchant vessels at the Camden yards of the New York Shipbuilding Co. is regarded with keen interest. It is estimated these vessels would take fully 5000 tons of plates each. Between 1200 and 1300 tons of plates are required for freight cars recently let by the Lackawanna. Prices are steady.

Cleveland, Aug. 27.—Plate mills are enjoying a steady inflow of specifications against contracts, all for miscellaneous purposes and, for the most part, in 20 to 50 or 100-ton lots. Occasionally orders involve up to 250 and orders for 500 to 750 tons at a time seem rare. One of the latter size was received from Lima, O., by a local mill for locomotive boilers and fire boxes. Buying is a shade less than in July. Boiler and tank shops continue active, especially those building boilers for power houses and tanks for gasoline stations and domestic oil storage systems. Plates usually are two to four weeks deferred. Mills operate at 60 to 75 per cent of capacity. The 1.95c, Pittsburgh price applies on small and fair sized tonnages.

CONTRACTS PLACED

3250 tons, pipe line, Vancouver, to Harrison & Lamond Construction Co.
750 tons, pipe line, Vancouver, to Vancouver Engineering Works.

CONTRACTS PENDING

10,000 tons, pipe line, Everett, Wash. Bids Aug. 28.

To Redeem More Bonds

New York, Aug. 27.—The United States Steel Corp. today recommended two issues of two subsidiaries, aggregating a face value of $31,770,000. The bonds are of the Indiana Steel Co. first mortgage 5 per cent, due in 1952, and National Tube Co., first mortgage 5 per cent, due the same year. The action is a continuation of the policy of reducing the corporation's bonded indebtedness.

Indian Iron Imported

Philadelphia, Aug. 27.—Imports at this port during the week ending Aug. 24 included 1230 tons of pig iron from British India; 102 tons of pig iron from Norway; 15 tons of steel scrap from Germany; 47 tons of steel bars from Belgium; 75 tons of steel bands from Belgium; 497 of structural shapes from Belgium and 102 tons of structural shapes from Germany.

Steel production in Czechoslovakia for the first four months of 1929 was 803,000 metric tons, 22½ per cent greater than the same period in 1928.

Pipe

250,000-Ton Gas Line Up Soon—Cast Demand Fair—New York Prices Weaken

DOHERTY and Texas Co. interests may merge to complete a 250,000-ton steel gas line, the heaviest to come up so far. Vancouver purchased 1350 tons of cast pipe while Oakland, Calif., has 1385 tons up. Lamar, Colo., awarded 2700 tons. A New York state hospital will need 1000 tons. A Chicago water line of 24-inch size will mean several thousand tons.

PIPE PRICES, PAGE 542

Pittsburgh, Aug. 27.—Makers of large size line pipe are catching up with their order books. The largest outstanding business is 250,000 tons for a gas line from Texas to Chicago, and perhaps to Omaha, Nebr. This project originally was identified with the Doherty interests of New York. Another group, headed by the Texas Co. likewise has been considering a similar line, and whether separate Doherty and Texas Co. lines will be laid or the interests of the two groups merged, is not determined. At the moment, the matter of franchises is a decisive one. Day-to-day orders for small sizes of line pipe are fair.

Automotive specifications for tubing show a marked decline. Demand for boiler tubes for locomotives and stationary boilers has been fairly good all year. Delivery on tubing is slightly deferred, while prices are firm.

New York, Aug. 27.—Cast prices continue unsteady, sizable tonnages bringing out keen competition and weaker figures. Volume of business is light even for this season. Scattered carload shipments are reported. In this type of business prices are firmer, $37.50 to $39.50 for class B 6-inch and over delivered, New York.

Chicago, Aug. 27.—Indications are that buying of water pipe should enjoy a moderate pick-up in the autumn. Probably several thousand tons will be required for the Chicago avenue waterworks tunnel, to extend water service to the west side of Chicago, but no announcement is forthcoming as to how much will be bought this year. This pipe will be over 24-inch. It is understood the 300 tons of 6, 8 and 10-inch centrifugal pipe for Cincinnati, O., will go to the low domestic bidder, as the French pipe offered will not meet the preliminary test requirements. Carload business is only fair. Production is estimated at about 70 per cent. The quotations for pressure pipe in the North Central markets are reported on the basis of $37 to $38, Birmingham, for the 6 to 24-inch sizes in carload lots.

Birmingham, Ala., Aug. 27.—While unfilled tonnage is lower than the high figures prevailing a short time ago, shops here are operating four and five days a week, shipments are active. A few lettings have been reported recently for movement to the west and middle west. Negotiations are under way for further shipments into far west where pipe laying will not be interferred with by weather conditions.

Cleveland, Aug. 27.—Standard full weight merchant pipe jobbers are enjoying a good turnover, this being practically the peak of the season. Repeat orders are numerous but small. Jobber stocks are not heavy and mills can make almost immediate deliveries. Lapweld backlogs still are heavy with deliveries deferred accordingly by several weeks.

CONTRACTS PLACED

2700 tons, 4 to 14-inch centrifugal, Lamar, Colo., to unstated maker.
850 tons, Delavaud pipe, 6 to 12-inch class C, for Vancouver, to Evans, Coleman & Evans.
515 tons, 6 and 12-inch monocast pipe, McKinley hill district improvement, Tacoma, Wash., to American Cast Iron Pipe Co., through S. A. Moceri, general contractor, as noted Aug. 15.
500 tons 8 to 12-inch monocast pipe, Edmonton, Alta., to American Cast Iron Pipe Co.
500 tons 4 and 8-inch class B, Vancouver, to Gordon & Belyea.
450 tons, 6 and 8-inch for Royal Oak, Mich., awarded through contractor.
325 tons, 20-inch cast pipe for Borough of Queens, N. Y., to United States Pipe & Foundry Co.
199 tons, 4 to 8-inch class B, Alturas, Calif., to Heafey-Moore Co.
162 tons, 6 and 8-inch class B, Great Falls, Mont., to unnamed interest.
100 tons 6 and 8-inch, Warren, Mich., awarded through contractor.

CONTRACTS PENDING

4400 lineal feet of 6-inch cast iron pipe water mains with eight hydrants, for Eagle River, Wis. Bids close Sept. 3.
1385 tons, 6 to 12-inch class B, East Bay Municipal Utility District, Oakland, Calif. Bids opened.
1000 tons, 3 to 12-inch for state hospital, Wessaic, N. Y. Bids in.
500 tons, odd sizes for South Park board, Chicago; bids in.
377 tons, 6 to 10-inch class B, Anaheim, Calif. Bids opened.
303 tons, 10-inch class B, Coquille, Oreg. Bids Aug. 26.
192 tons, 2-inch class B, Los Angeles. Bids Aug. 27.

STEEL PIPE PENDING

250,000 tons for a gas line from Texas to Chicago and possibly to Omaha, Nebr.; projected by Henry L. Doherty interests of New York. The Texas Co. also is considering a similar line.

First quarter production of pig iron in Japan was 388,492 gross tons, compared with 365,190 tons for first

quarter of 1928; steel ingot production was 545,762 tons, compared with 441,868 tons.

Tin Plate

Outlook for Remainder of Year Is Good—Market Steady

TIN PLATE PRICES, PAGE 542

Pittsburgh, Aug. 27.—Tin plate mills are operating at 85 to 90 per cent. The outlook is for fairly heavy September and October, and a good November and December, the latter months being stimulated by anticipated business from important can-makers. Most makers of tin plate report a fair inflow of new business, with occasional large lots for prompt delivery needed because of underestimated requirements. The 1929 output is expected to equal 1928. Tin plate is $5.35, Pittsburgh, per 100-pound base box.

New York, Aug. 27.—The Nippon Oil Co. has temporarily withdrawn an inquiry for approximately 20,000 boxes. Sellers look for a reappearance in about a month, involving possibly a heavier quantity. Usually, it is said, this interest buys at least three times the quantity recently inquired for.

Will Present Papers at Fuels Meeting

Announcement has been made of papers to be presented at the third National Fuels meeting, to be held in Philadelphia, Oct. 7-10, by the fuels division of the American Society of Mechanical Engineers. Technical sessions will be held at Bellevue-Stratford hotel and over 25 papers will be read, including symposiums on mechanical stoker design, domestic heating, smoke abatement and kindred subjects. Included on the list of papers are the following:

"Low Temperature Carbonization," by J. McQuade, Benjamin Franklin Coal Co. of W. Va., Moundsville, W. Va.
"Water-Cooled Furnace Walls," by Ollison Craig, consulting engineer, Riley Stoker Corp., Worcester, Mass.
"Water-Cooled Furnace Walls," by J. S. Bennett, engineer, and P. N. Oberholtzer, engineering department, American Engineering Co., Philadelphia.
"Economics of Industrial Heating," by J. A. Doyle, vice president, W. S. Rockwell Co., New York.
"Electricity for Industrial Heating Furnaces," by W. S. Scott, Westinghouse Electric & Mfg. Co., Mansfield, O.
"Gas for Industrial Heating Furnaces," by H. O. Loebell, chief engineer, Combustion Utilities Corp., New York.
"Oil for Industrial Heating Furnaces," by Leod, D. Becker, editor, *Fuel Oil Magazine*, New York.

H. E. Lewis Goes Abroad

Philadelphia, Aug. 27.—Vice President H. E. Lewis of the Bethlehem Steel Co., sailed for Europe last week for a 6-week stay.

General Parts Corp., Flint, Mich., has changed its name to Genesee Parts Corp.

Sheets

Mills Continue High Rate of Operations Through Usual Slack Period

LARGE backlogs, plus a steady inflow of new business, have enabled sheet mills to continue a high rate of operations throughout the usual slack period of the summer. The leading interest is operating at 98 per cent. Operations in the Chicago district are likely to establish a record for August. Prices generally are firm, except for some softness in galvanized.

SHEET PRICES, PAGE 541

Pittsburgh, Aug. 27.—Sheet producers have bridged what is normally the slack period of the summer—from June to August—with practically no cessation in operations. This accomplishment has been partially at the expense of backlogs but, on the whole, represents continuing heavy demands from diversified sources. Automotive specifications for most makers do not equal those of 30 and 60 days ago but some interests are ordering for new models. Farm implement manufacturers expect to have a fall equal to last year's, which was the best in history. The electrical, radio and electric refrigerator industries are specifying at the best August rates in their histories. The leading maker of sheets is operating at about 98 per cent and sees nothing to disturb this rate for many weeks. An important maker of blue annealed sheets cannot make delivery under four to five weeks although some makers can do better. Blue annealed plates are 2.20c, Pittsburgh, and blue annealed sheets 2.35c. Due partially to preferentials to jobbers, galvanized sheets are soft and range from 3.50c to 3.60c. An important maker, booked five weeks ahead, has 3.60c as its minimum. Autobody sheets are 4.10c, although the tendency to take prices on material for specified parts makes the base price less important.

New York, Aug. 27.—Galvanized sheets are holding at 3.50c, Pittsburgh. The market on black is generally 2.85c to 2.95c, with most business going nearer the lower figure and in some cases as low as 2.80c. While less can be done in some cases, most deliveries on galvanized are around four weeks and on black three to four weeks. Blue annealed plates are unchanged at 2.20c, Pittsburgh, and blue annealed sheets, 2.35c. Deliveries range from two to five weeks, with most mills quoting nearer the outside figure.

Detroit, Aug. 27.—Ford continues to specify sheets in good volume and to press for delivery. Chrysler's needs are heavier than a month ago. Buick's extensive operations are not reflected in sheet requirements because July receipts exceeded consumption. Chevrolet is holding its purchases close to its needs, which are shrinking, as its run on the current model nears its end. Sheet specifications as a whole are comparable to last August but fully a third below the spring peak. The base prices of most grades are firm, autobody being 4.10c, Pittsburgh; black 2.75c, and blue annealed 2.35c.

Chicago, Aug. 27.—Indications are that sheet mill production this month may establish a record in this district. Fresh business in blue annealed sheets is being added steadily, while backlogs are extended farther than 16 weeks. Orders likewise are picking up in the lighter gages. Further concessions are reported at several market points. While prices figuring as low as 3.60c have been done in galvanized, the galvanized market here is quoted at 3.75c, Chicago, district mills, as a minimum.

St. Louis, Aug. 27.—Producers and distributors of sheets in this district are well satisfied with the market. The leading local producer is operating at capacity in all departments, and has business enough to maintain that rate for some time. This interest quotes St. Louis delivered prices as follows: Black, 3.27c; blue annealed, 13 gage, 2.67c, and 10 gage 2.52c; galvanized, 3.92c and tank plates, 2.27c.

Youngstown, O., Aug. 27.—Sheet mill operating schedules have been increased this week to 94 per cent of capacity against 80 per cent last week, the formerly disabled Niles plant resuming yesterday in full. Some contracts are beginning to be negotiated with consumers for fourth quarter delivery but so far these have been closed in only a few instances. By the middle of September mill managers here believe they will be receiving the usual heavy volumes of automotive specifications. These materials schedules cover both autobody and the common grades of sheets. Other users of sheets such as steel furniture builders, roofing materials makers, car builders, etc., are manifesting more interest in the sheet market for the immediate future. Common black sheets hold at 2.85c, Pittsburgh, for No. 24 gage; blue annealed, which continues in good demand, brings 2.20c for 9 and 10 gage, and 2.35c for No. 13 gage; galvanized, 3.60c here with most makers but 3.50c being done in sharp competition; and autobody is firm at 4.10c.

Cleveland, Aug. 27.—Certain grades of sheets continue to enjoy a fairly good demand, such as electrical sheets, metal furniture grades, enameling stock, etc., for radio, electric refrig-

(*Concluded on Page* 557)

Structural Shapes

Illinois Steel Program Means 40,000 Tons —Half Placed—Other Lettings Numerous —Prices Fair—Pending List Active

EXPANSION programs at South Chicago, Ill., and Gary, Ind., involving 20,000 tons placed and a similar tonnage pending, stand out in the week's structural news. A bridge awarded at Portland, Oreg., involves 8300 tons. More than 10 other awards involve 1000 to 3500 tons apiece, including a bridge at Rochester, N. Y., of the latter size. Four bridges at Charleroi, Pa., take 2100 tons. About 5000 tons of subway work at Philadelphia is held up by injunctions. Pending work elsewhere, looms importantly, however, topped by a 2500-ton bank at Philadelphia, Inland Steel's expansion program requiring 2400 tons, a similar tonnage for Pennsylvania railroad's catenary towers, and 2000 tons for the Ohio river boulevard at Pittsburgh. Prices are firm.

STRUCTURAL SHAPE PRICES, PAGE 541

New York, Aug. 27.—Awards and inquiries for structural shapes have again declined this week. Some of the tonnage placed in this district was for bridge work, the state of Pennsylvania taking 600 tons from McClintic-Marshall Co. Bids on 5800 tons for the King's county hospital, Brooklyn, N. Y., have been held up for revision. The New York Central warehouse at 161st street will take 3000 tons. Shape prices remain firm and unchanged. Mills operate close to capacity and are reducing backlogs during the present lull in new buying.

Worcester, Mass., Aug. 27.—Demand for structurals is light and but a few small jobs are outstanding. One fair-sized award, 200 tons for a school in Waltham, Mass., went to Eastern Bridge & Structural Co.

Boston, Aug. 27.—Structural interests had another quiet week. The only large tonnage, 1100 tons, for train shed canopies for the South station, used by New York, New Haven & Hartford and Boston & Albany railroads. Practically the only pending project is a bridge for Fall River, into which 100 tons will go.

Buffalo, Aug. 27.—Local awards include small lots, 190 tons for a new Delaware avenue office building, three schools aggregating 585 tons and a number of smaller jobs to the Buffalo Structural Steel Co. Large tonnage is in prospect for September coverage, it is reported.

Philadelphia, Aug. 27.—Shape demand is spasmodic, that is, big one week and slow the next. Generally, eastern mills continue able to maintain operations substantially at capacity. Prices have shown some softness in the past week but in a general way, the market on standard shapes in the east is 1.90c to 2.05c, base, nearest mill.

Pittsburgh, Aug. 27.—Placing of four viaducts by the Pittsburgh & West Virginia railroad, involving 2100 tons, with the American Bridge Co. is the largest structural award of the past few days. A number of small jobs requiring less than 100 tons have been closed. Figures have been taken on about 2000 tons of structurals for the Ohio river boulevard, for which Booth & Flinn have the general contract. A maker of wide flange sections plans shortly to announce several larger sizes. Structural steel backlogs of mills are slowly being whittled away. Plain material is 1.95c, Pittsburgh.

Cleveland, Aug. 27.—Since the 7000-ton bridge award at Toledo, O., last week, the structural market has slipped back into comparative quietness. A large number of small jobs are up and several are placed every few days. The 166-ton warehouse, for instance, for the Crucible Steel Co. of America, went to Kilroy Structural Steel Co. The Austin Co. here has just been awarded a contract for the design and construction of a $20,000,000 automobile plant at Nishni Novgorod, Russia for the soviet government. Mills report that specifications trend downward slightly. Prices are unchanged, with 1.95c, Pittsburgh applying in the usual case. No inquiries are out as yet for fourth quarter.

Cincinnati, Aug. 27.—Three major building operations will be under way here soon, involving 15,000 to 20,000 tons of steel. These include a 43-story office building having a 27-story hotel, large garage, department store and arcade in conjunction with it for the Starrett Investing Corp. of New York; a $2,225,000 church and store building with tower; and a 14-story addition to the Western & Southern Life Insurance Co. office building .

Chicago, Aug. 27.—Industrial building and bridge work continues to lead in structural activity. Plain material deliveries are three to seven weeks. Fair specifications are being received from the car builders. Inland Steel Co., is asking for figures on 2400 tons for plant extensions at Indiana Harbor. Several new projects are out at Milwaukee, including 2400 tons for a bank building. Airport work is expected to show substantial volume in the next few months. The price for plain material is unchanged at 2.05c, Chicago base.

The American Bridge Co. now is fabricating about 20,000 tons for Illinois Steel Co.'s new beam mill, South Chicago. This company is expected to start work soon on other units in its expansion program at Gary and South Chicago, estimated to involve at least 20,000 tons more.

Portland, Ore., Aug. 27.—St. Johns bridge, requiring 8300 tons has been awarded, the superstructure, 6000 tons, going to the Wallace Bridge & Structural Steel Co., a 2000-ton viaduct going to American Bridge Co., and the 300-ton substructure going to Gilpin Construction Co.

Awards Compared

	Tons
Awards this week	50,216
Awards last week	57,935
Awards two weeks ago	42,021
Awards this week in 1928	15,669
Average weekly awards, 1928	39,082
Average weekly awards, 1929	42,316
Average weekly awards, Aug.	45,884
Total awards to date, 1928	1,329,186
Total awards to date, 1929	1,481,067

CONTRACTS PLACED

20,000 tons, beam mill, Illinois Steel Co., South Chicago, Ill., to American Bridge Co.

8300 tons, St. Johns bridge, Portland, Oreg.; 6000 tons, superstructure, to Wallace Bridge & Structural Steel Co.; 2000 tons, viaduct, to American Bridge Co., and 300 tons, substructure, to Gilpin Construction Co.

3500 tons, Smith Street bridge, Rochester, N. Y. to Phoenix Bridge Co.

2100 tons, four viaducts in Chalreroi, Pa., for Pittsburgh & West Virginia railroad, to American Bridge Co.

1700 tons, Lenox Hill hospital addition, New York, to Harris Structural Steel Co.

1200 tons, building, Milwaukee Electric Railway & Light Co., Milwaukee, to Wisconsin Bridge & Iron Co.

1200 tons, building, Southwestern Bell Telephone Co., Dallas, Tex., to McClintic-Marshall Co.

1100 tons, airport, Wayne county, Mich., to R. C. Mahon Co.

1100 tons, canopies for South station trainshed, Boston, to New England Structural Co.

1000 tons, bakery building, Gordon Baking Co., New York, to Levering & Garrigues Co.

1000 tons, power house at Sayreville, N. J., to American Bridge Co.

1000 tons, 100 x 400-foot addition, Ft. Pitt Bridge Works, Canonsburg, Pa., to own shops.

650 tons, highway bridge, Mt. Carmel, Pa., to Bethlehem Steel Co.

600 tons, Capilano bridge, West Vancouver, B. C., to Western Canadian Structural Steel & Bridge Co.

600 tons, state highway bridges, Pennsylvania, to McClintic-Marshall Co.

585 tons, schools at Buffalo, No. 17, 130 tons; No. 33, 225 tons and No. 48, 230 tons, to Buffalo Structural Steel Co.

500 tons, addition, Marathon Paper Co., Menasha, Wis., to Worden-Allen Co.

440 tons, building, S. H. Kress Co., Greensboro, N. C., to Ingalls Iron Works Co.

400 tons, bridge, Atlantic county, N. J., to Bethlehem Steel Co.
325 tons, sheds, terminal station, Birmingham, Ala., to Virginia Bridge & Iron Co.
300 tons, building, Western Clock Co., Peru, Ill., to Mississippi Valley Structural Steel Co.
250 tons, new emergency hospital at Milwaukee, to Wisconsin Bridge & Iron Co.
225 tons, New Jersey state bridges, to McClintic-Marshall Co.
200 tons, building for Lamson & Sessions Bolt Co., North Birmingham, to Virginia Bridge & Iron Co.
200 tons, building, Monticello Drug Co., Jacksonville, Fla., to Southern Engineering Co.
200 tons, school at Waltham, Mass., to Eastern Bridge & Structural Co.
190 tons, Vars building, Delaware avenue, Buffalo, to Buffalo Structural Steel Co.
180 tons, boiler house, Great Northern railway, Hillyard, Wash., to Hofius Steel & Equipment Co.
175 tons, New York state bridge, to American Bridge Co.
166 tons, warehouse, Crucible Steel Co. of America, Cleveland, to Kilroy Structural Steel Co.
150 tons, 5-story plant on Seranton road, Cleveland, to Massillon Bridge & Structural Co., through H. K. Ferguson Co.
140 tons, apartment, Pacific near Webster street, San Francisco, to McClintic-Marshall Co.
125 tons, Soldiers' and Sailors' Memorial bridge, Harrisburg, Pa., to McClintic-Marshall Co.
115 tons, Reading railroad passenger station, Trenton, N. J., to Bethlehem Fabricators Inc.
100 tons, bridge over Cheat river, Pennsylvania, to Jones & Laughlin Steel Corp.
100 tons, plant building, Temple Corp., Laverne and West Sixty-fifth street, Chicago, to Jones & Laughlin Steel Corp.
100 tons, redecking Eleventh street bridge, Tacoma, Wash., to Star Iron Works.
Unstated tonnage, Nicola river bridge, British Columbia, to Hamilton Bridge Co. Ltd.

CONTRACTS PENDING

20,000 tons, expansion at South Chicago, Ill., and Gary, Ind., for Illinois Steel Co. in addition to 20,000-ton beam mill awarded American Bridge Co.
3000 tons, storehouse, New York Central railroad, 161st street, New York.
3000 tons, Ridge avenue subway section, Philadelphia; injunction requested.
2000 tons, Plaza subway section, Philadelphia; tied up by injunction against award of contract.
2500 tons, Market street bank building, Philadelphia.
2400 tons, catenary towers, Pennsylvania railroad.
2400 tons, plant extension work at Indiana Harbor, Ind., for Inland Steel Co., 300 tons, extension to 24-inch mill, and 900 tons for incinerator building; figures being taken.
2300 tons, Parker school, Chicago; Hansell-Elcock Co., low bidder.
2000 tons, criminal courts-jail building, Cleveland; Warner-McCornack & Mitchell, architects.
2000 tons, Ohio river boulevard, Pittsburgh; Booth & Flinn, general contractors.
1600 tons, Henry avenue bridge, Philadelphia; Francis A. Canuso, low bidder.
1000 tons, six state highway bridges, New Jersey.
1000 tons, hotel, Fourteenth and Jackson streets, Oakland, Calif. Bids opened.
800 tons, 12-story office building, Jersey City, N. J.
800 tons, Atlantic clubhouse, Camden, N. J.
738 tons, bridge near Yreka, Calif. Bids Sept. 11.
600 tons, apartment house, Fifth avenue, New York.
550 tons, generating plant, Phoenix, Ariz. Bids being received.
400 tons, high school, Little Falls, N. Y.
300 tons, building, Scarsdale, N. Y.
250 tons, hangar, Curtiss Aircraft Corp., Cleveland; general contract to John Gill & Sons, Cleveland.
240 tons, Casino, Rye, N. Y.
150 tons, addition to apartment, Sacramento street, San Francisco. Bids being received.
150 tons, church, Rye, N. Y.
150 tons, hangar, Clifford K. Ball, Cleveland.
150 tons, service building, White Motor Co., Cleveland. Bids filed Aug. 26.
150 tons, building, Ohio Oil Co., Findlay, O.; general contract to Lundoff, Bicknell Co., Cleveland.
140 tons, apartment, Pacific near Webster street, San Francisco. Bids being received.
100 tons, building, Cleveland Universal Steel Jig Co., Cleveland; Kalsch & Hoefler, architects.

Concrete Bars

Individual Items Still Large — Pending List Fair — Prices Mostly Steady

PRESENCE of such items as a 1000-ton power plant, a 700-ton warehouse, a 600-ton cold storage plant, a 700-ton pipe shop, etc., aids the concrete bar total this week. Presence of several inquiries for 300 tons or more at a time, helps prospects considerably. New Jersey bridge work will mean about 1000 tons. Prices are steady in most sections, excepting Cleveland and Chicago.

REINFORCING BAR PRICES, PAGE 541

Chicago, Aug. 27.—Several large reinforcing bar projects are reported in addition to the 1600-ton sewage treatment works awarded a week ago. A 1000-ton power plant for a utilities company, and a 7000-ton pipe shop building have been closed. A grain elevator at Superior, Wis., will take 500 tons. About 400 tons will be required for the Hinsdale, Ill., sewage treatment works, and an unstated tonnage is out for the Rockford, Ill., sewage treatment works. Billet bars are quoted at 2.30c, Chicago.

Boston, Aug. 27.—About 600 tons of concrete bars were sold here last week. Of this total, 300 tons represented a contract to the Barker Steel Co. for a hospital building at Waltham, Mass. The remainder figured in odd jobs.

Buffalo, Aug. 27.—A good demand for reinforcing bars continues. One new 200-ton inquiry is for a bakery. Several smaller lots wanted for early delivery. Older inquiries still pending include 1000 tons for the municipal building and 800 tons for the addition to the Buffalo General Electric Co. plant. Current prices on lots for shipment direct from mills, uncut, in carloads is 2.315c, Buffalo.

New York, Aug. 27.—Concrete bar prices are steady at 2.90c out of New York warehouse. A fair volume of business is moving. Small lot shipments are brisk. Large awards are few. Bridge work in New Jersey will require close to 1000 tons.

St. Louis, Aug. 27.—Producers of reinforcing concrete bars in this district operate at capacity. They can maintain that pace for several weeks before exhausting backlogs. Active demand comes from a variety of sources, but the heaviest tonnages are required in highway construction, river and levee work and municipal improvement jobs. Recent lettings have not been of great size individually, but the aggregate is impressive.

Pittsburgh, Aug. 27.—Most concrete bar jobs recently have involved small lots, in the vicinity of 50 tons. Plans came out yesterday for the H. J. Heinz Co. auditorium, requiring about 100 tons. For mill lengths, 2.05c, Pittsburgh. is quoted and for cut lengths, 2.30c.

CONTRACTS PLACED

1000 tons, power plant, Midwest Utilities Co., Peoria, Ill., to American System of Reinforcing.
815 tons, building, Jewel Tea Co., Barrington, Ill., to Kalman Steel Co.; previously reported going to unstated fabricator.
700 tons, Fox warehouse, Hartford, Conn., to Truscon Steel Co.
700 tons, addition to pipe shop, Kohler Co., Kohler, Wis., to American System of Reinforcing.
600 tons, cold storage plant, Consolidated Gas, Electric Light & Power Co., Baltimore, to McClintic-Marshall Co.; incorrectly included in structural shape awards last week.
300 tons, hospital building, Waltham, Mass., to Barker Steel Co.
200 tons, building, Ajax Printing Co., Chicago, to Inland Steel Co.
150 tons, highway work, Speedway Construction Co., Cleveland, to the Paterson-Leitch Co.
125 tons, building, Sylvania Industrial Corp., Fredericksburg, Va., to McClintic-Marshall Co.
100 tons, Park hotel, Kalamazoo, Mich., to Concrete Engineering Co.
100 tons, sewage disposal plant, Greenville, Pa., to Electric Welding Co.
100 tons, building, California Institute of Technology, Pasadena, Calif., to Soule Steel Co.
100 tons, hotel, Metaline Falls, Wash., to Pacific Coast Steel Co.
100 tons, apartment, Racine, Wis., to Calumet Steel Co.

Awards Compared

	Tons
Awards this week	4,275
Awards last week	10,488
Awards two weeks ago	5,540
Awards this week in 1928	5,907
Average weekly awards, 1928	6,189
Average weekly awards, 1929	6,301
Average weekly awards, Aug.	6,009
Total awards to date, 1928	240,305
Total awards to date, 1929	220,537

CONTRACTS PENDING

2300 tons, wharf, Fourteenth street, Oakland, Calif.; bids opened.
500 tons, subway route 108, section five, New York.
500 tons, grain elevator, at Superior, Wis., general contract to Fegles Construction Co.
500 tons, sewage treatment works, Rockford, Ill.
285 tons, paving in Marin county, Sacramento, Calif. Bids Sept. 11.
210 tons, wharf, foot of Ninth street, Oakland, Calif. Bids received.
200 tons, for Purity plant, Grennan Bakeries Inc., Buffalo; bids Aug. 29.
100 tons, foundations, H. J. Heinz Co. au-

ditorium, Pittsburgh, plans by Albert Kahn & Co., Detroit.
100 tons, Hebrew Theological college, Chicago; general contract to Callner Construction Co.

Iron Ore

Consumption Shows Large Increase Over Last Year

IRON ORE PRICES, PAGE 542

Cleveland, Aug. 27.—Blast furnaces consumed 5,808,473 tons of Lake Superior iron ore in July, 1,175,566 tons more than in the same month last year. The Lake Superior Iron Ore association's report follows:

	Tons
Ore consumed in June	5,676,652
Ore consumed in July	5,808,473
Increase in July	131,821
Ore consumed in July, 1928	4,632,907
Ore on hand at furnaces Aug. 1, 1929	24,245,139
Ore on Lake Erie docks Aug. 1, 1929	4,452,100
Total at furnaces and Lake Erie docks Aug. 1, 1929	28,697,239
Total, Aug. 1, 1928	27,208,622

River Shipments Lower

Pittsburgh, Aug. 27.—Shipments of iron and steel on both the Allegheny and Monongahela rivers declined in July, one direct result being a lowering of the tonnage carried on the Ohio river. For the seven-month period ended with July, shipments over the Monongahela show a gain over the comparable period of 1928, but shipments on the other rivers receded, as the following comparison shows:

1929	Allegheny	Monongahela	Ohio
January	.....	80,402	48,471
February	.....	83,358	72,203
March	25	93,627	92,040
April	210	99,067	105,472
May	525	88,340	102,162
June	722	116,157	116,679
July	25	109,051	102,963
Total 7 mos.	1,507	669,992	639,990
1928			
January	330	78,069	69,750
February	385	73,360	87,635
March	725	77,908	77,945
April	470	87,581	110,356
May	1,863	86,722	112,818
June	2,350	75,422	98,156
July	.....	91,834	90,145
Total 7 mos.	6,123	570,936	645,805
August	50	109,738	124,066
September	200	136,227	125,062
October	1,130	131,281	130,808
November	800	143,238	137,019
December	.....	79,595	78,213
Total	8,303	1,160,975	1,239,973

Electric Concerns Merge

Dayton, Aug. 27.—General Kontrolar Co., until two years ago locoated in New York, has been merged with the Leland Electric Co. here. The Kontrolar firm is a pioneer in development of electric controls and has specialized on a mercury switch utilized in electric display signs, traffic signals and highway crossing beacons. The Leland company, founded in 1920, makes small electric motors in a plant here.

Means Stamping Co., Saginaw, Mich., has increased capital from $20,000 to $40,000.

Rails, Cars

Lackawanna Buys 1391 Cars—12,000 to Be Asked for By Oct. 15—Rails Bought Sooner

LACKAWANNA'S purchase of 1250 cars and 141 passenger coaches puts new life into the car market. Chicago steel men estimate that 12,000 cars will be on inquiry there by Oct. 15. Orders for about 30,000 tons of rails are expected by Sept. 15. Track fastening orders still involve 3000 tons weekly. Rail orders are scarce but a 75 per cent schedule will continue until October.

RAILROAD TRACK PRICES, PAGE 542

New York, Aug. 27.—Placing of 1250 freight cars, 141 electric passenger coaches, and a contract for conversion of 141 cars by the Delaware, Lackawanna & Western constitutes the largest car order in this district in several weeks. These 1250 freight cars bring the total purchases of this equipment so far this month up to approximately 2350 cars. While this is substantially heavier than the July business, it is under the monthly average for the year to date. It is possible, however, that final returns for August will be heavier than now indicated. Fresh inquiry is slack.

Approximately 525 freight cars and 350 passenger cars now are pending in the East. It is estimated that approximately 2580 freight cars are pending throughout the country.

Chicago, Aug. 27.—It is estimated here that at least 30,000 tons of rails for autumn delivery will be before the market by about Sept. 15. It is probable also that the carriers may begin ordering 1930 material earlier this year than is customary for advance buying. Only a few miscellaneous rail orders were placed, but heavy specifications were made against existing contracts during the week. Track fastenings sales amounted to about 3000 tons. Heavier buying is expected soon. Rail mill operations continue at 75 per cent, and are not expected to taper off before October.

Some believe that 10,000 to 12,000 cars will be on inquiry or on order by about Oct. 15. Buying of the 1000 gondolas by the Chicago, Milwaukee, St. Paul & Pacific railroad has been postponed to Sept. 12.

CAR ORDERS PLACED

Brooklyn & Queens Transit Corp., 50 surface car bodies, to the J. G. Brill Co. 50 to the Osgood Bradley Car Co., and 100 sets of trucks to the J. G. Brill Co.
Canadian National, one gasoline combination passenger and baggage rail motor car, to J. G. Brill Co.
Columbia & Greenville, 300 box cars to American Car & Foundry Co.
Delaware, Lackawanna & Western, 1250 freight cars, distributed as follows: 700 box cars and 250 hopper cars to the American Car & Foundry Co. and 300 box cars to the Magor Car Corp.; also 141 electric passenger cars, equipped with roller bearings, to Pullman Car & Mfg. Corp., with the General Electric Co. to supply the electrical equipment; a contract for converting 141 trailers, also to the American Car & Foundry Co.

CAR ORDERS PENDING

Board of Transportation, New York, 300 steel subway passenger cars, the American Car & Foundry low bidder with the Standard Steel Car Co. next.
Chicago, Milwaukee, St. Paul & Pacific, 1000 gondolas; award postponed until Sept. 12.

LOCOMOTIVE ORDERS PENDING

Condon, Kinzua & Southern, one locomotive.
Natchez, Columbia & Mobile, one or two locomotives.

Barrel Output Shows Sharp Increase

Washington, Aug. 27.—July production of steel barrels increased over June, making it the second best month of the year as reported by 27 companies operating 31 plants, to the dedepartment of commerce. Production was 790,175 or 64.2 per cent of capacity, compared with 61.8 per cent in June and 55.5 in July, 1928. Comparisons follow:

1928	Production	Shipments	Unfilled orders for delivery within 30 days	Unfilled orders for delivery beyond 30 days
July	647,844	645,881	341,346	891,066
Tot., 4 mo.	4,356,436	4,353,211	.....	.....
Aug.	677,313	675,600	319,495	744,863
Sept.	593,255	595,640	292,686	704,134
Oct.	656,021	661,009	301,782	522,090
Nov.	563,647	568,353	322,135	634,982
Dec.	551,113	549,913	246,460	1,110,983
Total (year)	7,397,784	7,403,726	.....	.....
1929				
Jan.	558,492	548,581	319,704	1,342,006
Feb.	567,398	563,532	345,365	1,198,481
Mar.	742,165	743,407	393,941	1,076,317
April	771,584	775,481	333,614	935,430
May	836,532	834,699	316,882	899,090
June	774,853	779,567	644,079	904,920
July	790,175	782,411	377,855	994,842
Tot., 7 mo.	5,041,199	5,027,678	.....	.....

Col. A. G. Mills Dies

Col. Albert G. Mills, senior vice president of the Otis Elevator Co., New York, with which interest he was associated for 52 years, died at his summer home in Falmouth, Mass., Aug. 26. He was 85 years of age.

Munro Iron Mining Co., Iron River, Mich., has changed its name to Hanna Iron Ore Co.

The Market Section

Wire

Buyers Not Interested in Fourth Quarter—Weakness in Nails Continues a Feature

MANUFACTURERS continue to give the wire market most support and are maintaining steady consumption in their products. Jobbers, on the other hand, as well as retail buyers, are taking relatively small tonnages. Nails are weak in all markets and concessions are being made generally. Prices of wire, otherwise, are holding fairly steady in all markets.

WIRE PRICES, PAGE 542

Pittsburgh, Aug. 27.—In general wire products moving to the manufacturing trade are good in volume and price, while those going to jobbers and retail outlets are soft in volume and price. In the immediate Pittsburgh district, nails are relatively stronger than in some other territory although concessions up to $2 a ton have been made in the official price of $2.65 to the dealer trade and $2.55 to large jobbers. Manufacturing wire is 2.50c, Pittsburgh. Some shrinkage in automotive requirements is reported. Fencing demand is light, largely on account of the intermediate season. Some makers believe that the volume and the price situation generally will be more stable in 30 days.

Worcester, Mass., Aug. 27.—Wire production remains at 85 per cent of capacity, with heavy demand for flat and round wire. Other lines are moving well with demand seemingly undiminished. Prices are firm at 2.75c for plain bright wire to dealers.

Cleveland, Aug. 27.—Plain manufacturers' wire demand is down considerably from the June-July rate. Jobbers buy only for immediate needs and exert pressure for lower prices. While some jobbers outside the city have paid 2.40c, some wire users inside the city are still paying 2.50c. Nails are competitive, each order being judged on its own merits and priced according to the competition incurred. Nail tonnage is low.

Chicago, Aug. 27.—Buyers of wire products are showing no interest in contracts for fourth quarter, but tonnage ordered out is holding to the average of this month. August specifications are expected to surpass July. Jobber orders are fair. Operations are about 65 per cent. Weakness persists in nails at some market points. Wire nails are quoted $2.60 to $2.70, base.

Annual Safety Congress To Convene Soon

The eighteenth annual safety congress of the National Safety council will be in session in Chicago, Sept. 30-Oct. 4. Thirty-six sections of the council will convene in the Congress and Stevens hotels during the week, discussing safety and its various phases in nearly all branches of industry. A safety exhibit has been arranged and will be on display at the exposition hall in the Stevens hotel.

The metals sections of the council will hold four sessions in the Stevens hotel. This program was presented in detail on Page 358 of the Aug. 8 issue of IRON TRADE REVIEW.

A steel bridge of the Northern Pacific railroad in Montana, weighing 57½ tons, recently was washed 230 feet downstream and buried under 20 inches of mud.

Cold Finished Steel

Shipments Larger than Specifications Due to Automotive Slackening

COLD FINISHED PRICES, PAGE 542

Pittsburgh, Aug. 27.—Specifications for cold finished steel to most makers fall somewhat short of shipments, due in large measure to curtailed automobile production. Cold finished bar makers have, accordingly, restricted their buying of soft bars. Improvement is looked for late next month in anticipation of the usual October comeback in automobile production. Cold finished bars are 2.30c, Pittsburgh.

Detroit, Aug. 27.—Cold finished bar demand is at as low a level as at any time this year. Automobile and parts manufacturers have curtailed buying in keeping with their operations. August shipments and specifications, while below July, are somewhat larger than last August. Users have no stocks and mills can make prompt delivery. Cold finished bars are 2.30c, Chicago, or 2.575c, delivered Detroit.

Strip

Lessened Demand Brings Better Delivery—Prices Are Holding at Firm Levels

MUCH restricted demand for both grades of strip has caused backlogs to decrease and in some cases to disappear, deliveries being much expedited. Prices are not weakened by this situation and are holding firmly. Some mills can give immediate rolling and are seeking business. Fall revival is looked for to bring a return of better demand.

STRIP PRICES, PAGE 542

Pittsburgh, Aug. 27.—New business in hot and cold-rolled strip continues to decrease but is high for the season. Production not having declined as completely as demand, backlogs have been lessening and on many sizes deliveries can be made in about three weeks. Most makers of strip look for an upturn in buying late in September or early in October. The decline in automotive requirements is marked. Hot strip is firm at 1.90c and 2.00c, Pittsburgh, depending on width, with full extras applying. Cold-rolled strip is 2.75c to 2.85c, Pittsburgh, the former price applying on large lots.

New York, Aug. 27.—Strip steel prices are steady. Three to four weeks continues a fair average for deliveries on hot rolled strip, and three to five weeks on cold-rolled strip material.

Cleveland, Aug. 27.—Hot and cold strip specifications continue to recede, and mills are able to offer much better deliveries than in July. Some cold strip makers have open schedules and operate at only 50 per cent of capacity. They name practically immediate delivery. A few hot mills are filled up for a few weeks on certain sizes, particularly narrow. Several need wide tonnage. Some still are shipping cold strips against 2.75c, Cleveland or Pittsburgh contracts, but are naming a 2.85c minimum in the open market.

Philadelphia, Aug. 27.—Strip mills continue to seek business, due to diminishing backlogs. Prices of hot rolled under 24 inches wide are firm, but on wider prices are soft. Cold strip continues 2.75c to 2.85c, with demand lighter.

Detroit, Aug. 27.—Although strip steel specifications have tapered considerably and some producers exhibit a decided need for business, prices have held rather firmly at 1.90c and 2.00c, Pittsburgh, depending on width. August shipments for some makers will be lower than July, but on the whole about equal to last August. It is not experted that requirements the remainder of the year will approach those of the earlier months. Cold strip is in slightly better demand than hot, and is quoted at 2.75c, Cleveland.

Nonferrous Metals

Prices Are Unusually Steady While Sales of Lead and Copper Are Active—Demand For Tin Lags—Zinc Market Is Quiet

Prices of the Week, Cents a Pound

	Copper			Straits Tin							
	Electro delivered	Lake delivered	Casting refinery	New York Spot	York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Aug. 21	18.00	18.07½	17.50	46.40	47.00	6.75	6.55	6.80	23.90	8.87½	35.00
Aug. 22	18.00	18.07½	17.50	46.62½	47.12½	6.75	6.55	6.80	23.90	8.90	35.00
Aug. 23	18.00	18.07½	17.50	46.75	47.25	6.75	6.55	6.80	23.90	8.90	35.00
Aug. 26	18.00	18.07½	17.50	46.50	47.00	6.75	6.55	6.80	23.90	8.87½	35.00
Aug. 27	18.00	18.07½	17.50	46.12½	46.62½	6.75	6.55	6.80	23.90	9.00	35.00

NEW YORK, Aug. 27.—Lead and copper sales were active this week, but zinc and tin were quiet. Prices of these metals were unusually steady.

Shipments of all metals continue large, and indications point to still larger shipments over the next few weeks. Much of the buying of copper, lead and tin in the past week was for immediate requirements. In copper and lead it appears as if substantial buying still must be done for September shipment. Foreign metal markets lately have been alternately encouraging and discouraging to domestic markets depending on the turn of affairs at the Hague conference.

Brass and copper mills continue busy in all departments. Copper wire is in especially good demand. The outlook in brass mill products is excellent, following record business to date this year.

Copper—Business has been done in copper every day on the basis of 18.00c, Connecticut, and was large on some days. A little of this business was for August shipment and very little beyond September. Even the September sales so far have been well below the average rate for other months this year so that it appears as if large buying would be necessary over the next few weeks. Export business increased from moderate to more than average size. This business also was for early shipment.

Zinc—Prime western continues in a quiet market but some business is being done for shipment over the next few months at 6.80c, East St. Louis. The price still is firm, and so is the price of ore at $44 a ton. Smelters expect buying of slab zinc to increase soon, as it appears to them that users have been buying less than they have been using. A little shading of the price has been done in one or two places, but as a whole the asking price has been remarkably uniform. High grade zinc is unchanged at 8.00c, delivered.

Tin—The market has been unusually quiet in the past week with the result that prices have sagged. The net result is slightly in favor of the bears, with somewhat more depression in futures than in spot. The buying lately has been mostly of spot and nearby positions. Not much change is expected in the monthly statistics. Some sentiment persists that the market will become strong soon.

Lead—Buying has been active in the past week, almost entirely for prompt and September shipments. Prices have been unchanged and supported by a strong undertone.

Aluminum—The market is unchanged but consumption is good and prices firm.—*Daily Metal Trade.*

Will Address Institute

Arrangements have been completed for the meeting of the British Institute of Metals in Dusseldorf, Germany, Sept. 9-12. Over 200 persons from ten different countries will participate in the sessions. Proceedings will open Sept. 9 with the annual autumn lecture. This will be given by Dr. A. G. C. Gwyer, who will speak on, "Aluminum and Its Alloys." Dr. Gwyer is chief metallurgist of the British Aluminum Co Ltd., Milton, Staffordshire, and has been an active member of the institute, being a charter member and author or co-author of numerous papers on aluminum, published by the Institute of Metals.

Arrangements to attend the Dusseldorf meeting can be made through the institute secretary, G. Shaw Scott, 36 Victoria street, London, S. W. 1.

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified

SHEETS	
Yellow brass (high)	23.25
Copper, hot rolled	27.75
Lead, full sheets (cut ¼c more)	10.00
Zinc sheet (100-pound base)	$10.25
Zinc strip (100-pound base)	$9.25
Aluminum, flat sheets, up to 10 gage, 3 to 72 inches wide	31.30
SEAMLESS TUBE	
Yellow brass (high)	28.25
Copper	29.25
RODS	
Yellow brass (high, full turnings)	21.25
Naval brass	24.00
WIRE	
Copper	19.87½
Yellow brass (high)	23.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	12.00 to 12.50
Chicago	12.00
Cleveland	12.50 to 13.00
HEAVY YELLOW BRASS	
Cleveland	8.50 to 9.00
ZINC	
New York	3.25 to 3.50
Cleveland	3.25 to 3.50
HEAVY COPPER AND WIRE	
New York	14.25 to 14.50
Boston	14.25 to 14.75
Chicago	13.00
Cleveland	14.00 to 14.50
RED BRASS BORINGS	
New York	11.00 to 11.50
YELLOW BRASS TUBING	
Cleveland	8.50 to 9.00
LIGHT COPPER	
New York	12.25 to 12.50
Chicago	12.00
Cleveland	12.50 to 13.00
LIGHT BRASS	
Boston	6.75 to 7.00
Chicago	7.00 to 7.50
Cleveland	6.50 to 7.00
ALUMINUM	
Clippings, Cleveland	17.00 to 17.50
Borings, Cleveland	9.00 to 9.50
Cast, Cleveland	12.50 to 13.00
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt aluminum No. 12	17.00 to 17.50
Brass ingot, 85-5-5-5	15.75 to 16.00

Coke By-Products

Distillate Demand Brisk and No Stock Accumulations

New York, Aug. 27.—Shipments against contracts for light oil distillates remain brisk, taking up current production without accumulation.

Coke Oven By-Products

Per Gallon at Producers' Plant in Tank Lots

	Spot
Pure Benzol	$0.23
90 per cent benzol	0.23
Toluol	0.40
Solvent naphtha	0.30
Commercial xylol	0.30
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.05½ to 0.06½
Naphthalene balls	0.06½ to 0.07½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.20 to 2.25

Prices are steady and unchanged. Benzol is reported more available in the spot market.

Supplies of phenol continue meager, most business moving at 16.00c, producers' plants, in 250-pound drums. Export business in toluol is fair.

Sulphate of ammonia is slightly more active, fertilizer interests contracting in greater volume at unchanged prices.

Warehouse

August Sales Exceed Usual Rate—Building Materials Active in the East—Sheet Prices Show Weakness

SALES above usual August rate are being enjoyed by warehouses in most sections. Structurals and bars lead in New York. Galvanized sheets and tubing sales gain in St. Louis. Prices on blue annealed and galvanized sheets are unsteady in the east. Otherwise quotations in most market sections remain unchanged.

New York—Warehouse demand continues moderately active, with most jobbers reporting sales ahead of last month. This latter is more or less the normal trend of events in the local jobbing market, but is interesting in view of the good volume of business placed this year in July. Structurals and bars continue in principal demand. Prices are steady except for easiness in blue annealed and galvanized sheets.

Philadelphia—Jobbers report that demand is steady, although below that of July and considerably under June's. Prices are firm and unchanged.

Baltimore—Demand for rolled steel products out of warehouse stocks here is not as large as earlier in the year, but is unusually good for this season. Prices continue to be firmly held at prevailing levels.

Buffalo—Warehouses report a good volume of daily business. August business holds up close to the average high level of the second quarter. A satisfactory third quarter volume is now anticipated. Prices are firm and unchanged. Plates and reinforcing bars continue to sell well.

Cleveland—Fair business in iron and steel products out of warehouse is reported here. The tonnage moving is not as large as it was in July or June but is above that shipped from the stores in August a year ago. Prospects for the autumn are considered bright. Prices are firm and unchanged.

Cincinnati—Demand for warehouse materials continues about on a par with that of July. Tonnages are considerably better than are usually bought during the August recession. Prices are unchanged.

Tulsa, Okla.—Jobber prices are firmly held, except on bands. These have been reduced to 4.24c.

St. Louis—Warehousemen report business well up to the average for late summer. Some items show considerable activity. Prices on virtually all standard items are steady at levels prevailing late in July.

Galvanized sheets have improved, particularly roofing material. Tubing purchases have gained. Building material is slow except possibly reinforcing bars and some sizes of structural shapes.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Houston	3.00c
Los Angeles	3.30c
New York†††‡‡	3.25c
Philadelphia*	2.80c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.15c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York††	2.80c to 3.24c
Philadelphia*	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.95c
Cincinnati	3.15c
Cleveland	2.25c to 2.44c
Detroit	2.30c to 3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl.	2.65c
Los Angeles, lcl.	3.00c
New York	2.90c to 3.30c
Philadelphia	2.77c to 3.02c
Pittsburgh	2.90c to 3.175c
San Francisco cl.	2.00c
San Francisco lcl.	2.25c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.00c
Houston	3.25c
Los Angeles	3.30c
New York†††‡‡	3.25c to 3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.10c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York‡‡	3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.60c
Boston 3/16-in.	3.915c
Buffalo	3.50c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Ft. Worth	4.50c
Houston	3.90c
Los Angeles	4.00c
New York‡‡	3.50c to 3.90c
Portland	3.75c
Philadelphia*†	3.25c
Pittsburgh**	3.35c to 3.45c
San Francisco	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.75c
Tulsa	4.20c to 4.34c

NO. 24 BLACK SHEETS

Baltimore*†	3.75c
Boston	4.85c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Cleveland***	3.75c to 3.90c
Detroit	3.95c
Ft. Worth	4.70c
Los Angeles	4.90c
New York	3.90c to 4.00c
Philadelphia*†	4.10c
Pittsburgh**	3.85c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.89c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore*†	4.50c
Boston	5.60c
Buffalo	4.70c to 4.85c
Chicago	4.90c
Cincinnati	4.90c
Cleveland***	4.60c to 4.75c
Detroit	4.75c
Ft. Worth	5.50c
Houston	5.40c
Los Angeles	5.30c
New York	4.50c to 4.75c
Philadelphia*†	4.85c
Pittsburgh**	4.85c to 4.95c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	5.10c
St. Paul	4.68c
Tulsa	5.10c to 5.35c

BANDS

Baltimore	4.00c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c to 3.65c
Detroit 3/16-in. and lighter	3.30c
Ft. Worth	4.25c
Houston	3.65c
Los Angeles	4.15c
New York‡‡	3.75c
Philadelphia*	3.30c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	4.24c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York‡‡	4.25c
Philadelphia*	3.55c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, Flats, hexagons, squares	
Baltimore (c)	3.50c(a)	4.00c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.60c	4.10c
Philadelphia*	3.60c	4.10c
Pittsburgh	3.70c	4.20c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.64c	5.14c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.15c

(b) Net base, straightening, cutting, boxing 1 ton or more.

(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	13.00c
Iron bars, round	6.10c
Iron bars, flats and squares	6.50c

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. **Less than 25 sheets. *†50 or more bundles. ***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Pacific Coast

Portland Bridge Involving 10,000 Tons Is Let—Pipe Orders Gain

LETTING of six contracts for the St. Johns bridge at Portland, involving 10,000 tons, in addition to cables, is the largest project of the year on the coast. Buying of pipe is on the increase and some large tonnages are being handled. Steel mills are well booked, mostly with small tonnages. Prices are holding firmly on all classes of materials.

Seattle, Aug. 23.—Important lettings of iron and steel, totaling about 15,000 tons, featured the Pacific Northwest market this week. Much of this tonnage was for projects in British Columbia and went to Canadian or foreign producers.

Wallace Bridge & Structural Steel Co. obtained the largest award involved in the St. Johns bridge, Portland, six separate contracts for this project having been let by Multnomah county commissioners yesterday. The Seattle firm will construct the superstructure on a bid of $986,445. This contract involves 6000 tons of structurals, of which about 2000 tons will be fabricated at the Portland plant of the Willamette Iron & Steel Works. American Bridge Co. obtained the next largest tonnage, 2000 tons of shapes, for the viaduct approach on a bid of $290,000. About 300 tons of structurals are involved in the substructure contract taken by Gilpin Construction Co. for $1,026,897. This involves a large tonnage of reinforcing as also does the concrete deck awarded to Lindstrom & Feigenson for $146,000. John A. Roebling's Sons Co. obtained the contract for the cables on a bid of $472,000. National Electric Co., Portland, will do the electrical work for $33,000.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Bids for the seventh division covering the west approach roadways will be received Sept. 5.

This is the largest steel job of the year in the Pacific Northwest, involving about 10,000 tons of structurals and reinforcing in addition to the steel cables. Bids were opened Aug. 19 but awards were delayed several days, due to a controversy over having the steel fabricated in local plants. The matter was compromised when President J. F. Duthie, of the Wallace company, agreed to do part of the fabricating at the Willamette plant.

Bars, Plates and Shapes

Mill prices remain firm and steady, merchant bars, plates and structurals at 2.35c and reinforcing at 2.30c.

Local steel mills are well supplied with work and report steady operations. Recent lettings have been mostly in car lots and no important tonnages have developed recently. Pacific Coast Steel Co. has taken 100 tons involved in a new hotel at Metaline Falls, Wash.

Vancouver, B. C., has awarded two important steel pipe contracts involving 4000 tons of plates. Harrison & Lamond Construction Co. Ltd., received the award for 19,500 feet of 36-inch pipe on a bid of $123,855, involving about 3250 tons while Vancouver Engineering Works will furnish 10,000 feet of 18-inch steel pipe, 750 tons, on a bid of $31,300. No other important tonnages of plates are pending except the Everett water project, bids to be opened Aug. 28.

Aside from the St. Johns bridge, no outstanding structural awards have been let. Local fabricating shops are well supplied with work and recent lettings have been mostly in less than 100 tons. Hofius Steel & Equipment Co. has taken 180 tons involved in the frame work for a boiler shop for the Great Northern raildroad, at Hillyard, Wash. Star Iron Works will furnish 100 tons of shapes involved in redecking the Eleventh street bridge, Tacoma. The government has awarded a contract for three bridges in Rainier national park involving 61 tons of structurals and 47 tons of reinforcing. Port Angeles Western railroad will build a bridge across the Solduc river, near Forks, Wash. Hamilton Bridge Co. Ltd., has the contract for a steel span for the Canadian Pacific railroad over the Nicola river, B. C. The structure will be 318 feet long and will cost $250,000. Tonnage involved is not known here.

Finished Materials

Wholesale jobbing business continues at a normal pace, the volume being somewhat larger than last year. August totals will be equal to July. Turnover is largely out of stock as mill buying is limited. Bars, angles, shapes and light plates are in good demand. Sheets remain sluggish, the turnover being smaller than in several years due, it is said, to the use of substitutes.

Pipe Awards Larger

Awards of cast iron pipe were heavier than normal this week and totaled nearly 2500 tons. Vancouver, B. C., awarded 850 tons to Evans, Coleman & Evans on a bid of $33,930. The same city awarded 500 tons to Gordon & Belyea on a bid of $21,003. It is understood that both contracts involved imported pipe. American Cast Iron Pipe Co. has closed for 800 tons for Edmonton, Alberta. The same company will also furnish 515 tons for the McKinley Hill district improvement, Tacoma, general contract to S. A. Moceri, as previously mentioned.

Old Materials

There is no change in the market. Steel mills are paying $10 and $11 gross for steel scrap and ample supplies are being received. There is little interest in cast iron scrap at $14.50 and $14.75 gross.

California Feels Lull

San Francisco, Aug. 24.—(*By Air Mail*)—Activity in the Coast markets for iron and steel products continues to reflect the seasonal let-up. Some improvement is noted in demand for cast iron pipe and movement of standard steel pipe and oil country goods is increasing. Bids were opened this week on 550 tons of girder rails and other track material for the municipal railroad, San Francisco. The Pacific Gas & Electric Co. has an inquiry out for close to 500 tons of line pipe.

Pig Iron and Coke

Foundry operations, with the exception of specialty plants, such as stove and sanitary ware manufacturers, continue on a more or less restricted basis and as a result sales and inquiries continue to involve unimportant tonnage. No change in pig iron quotations has occurred.

Bars, Plates and Shapes

The Soule Steel Co. took 100 tons of concrete bars for a college building in Pasadena. Bids were opened this week on 2300 tons and 210 tons, respectively, for wharves on Ninth and Fourteenth streets, Oakland. Prices in the bay district remain unchanged at 2.30c, base on carload lots and at 2.60c, on smaller tonnages.

While a number of small structural projects were placed this week, involving lots of 40 to 70 tons, only one letting in excess of 100 tons was reported. This was secured by McClintic-Marshall Co. and called for 140 tons for an apartment in San Francisco. Bids have been opened on 1000 tons for a hotel in Oakland and on 550 tons for a generating plant at Phoenix. Bids will be opened next week on 350 tons for a building at Decoto, Calif., for the Masonic home, on 150 tons for an apartment on Sacramento street, San Francisco and on 140 tons for an apartment on Pacific street, same city. Plain domestic shapes are firm at 2.35c, c.i.f.

Few awards of importance were noted in the cast iron pipe market this week. Great Falls, Mont., placed 162 tons and Alturas, Calif., 199 tons. Bids were opened this week on 1385 tons for the East Bay municipal uility district, Oakland, and on 377 tons for Anaheim, Calif. New inquiries include 303 tons for Coquille, Oreg., bids on which open Aug. 26 and 192 tons of pipe for Los Angeles.

Austin To Build Auto Plant for Soviet

Official confirmation of the award to the Austin Co., Cleveland, of a contract for design and construction of a huge automobile plant for the Soviet government at Nishni Novgorod, Russia, has been received by W. J. Austin, president. A cablegram from G. A. Bryant Jr., vice president, who negotiated the contract, said final approval had been given by officials at Moscow.

The project involves $20,000,000. The plant will be designed to produce 100,000 Ford cars annually and the Ford Motor Co. will provide technical assistance in the equipment of the plant and assist in manufacturing operations.

The engineering work will be handled in the main office of the Austin Co. in Cleveland, starting Oct. 1. The contract calls for a power house, foundry equipment plant, and a complete automobile plant. The site will consist of 5000 acres.

The works will be erected by Soviet labor under direction of American construction engineers, and the contract calls for quarters to provide for 25,000 people. This includes housing and stores.

Upon completion of designing and engineering details the Austin Co. will dispatch a large staff of experts to Russia to start construction. The plant will be completed in about two years.

July Plate Orders Gain

Washington, Aug. 27.—Orders for fabricated plates for July show an increase over June, according to the department of commerce. A comparison of figures for the seven months, as against the same period in 1928 also show a considerable gain. Monthly comparisons follow:

	Total	Oil storage tanks	Gas holders	Blast furnaces	Stacks and miscellaneous
1928					
July	35,959	16,881	1,848	499	12,159
Total 7 mos.	296,442	127,891	22,109	4,165	109,510
Aug.	47,245	24,807	1,814	429	17,579
Sept.	40,281	18,572	1,642	386	13,976
Oct.	53,983	23,960	1,861	2,435	17,480
Nov.	54,277	32,381	2,081	563	10,731
Dec.	36,254	14,217	2,216	655	12,060
(Year)	528,482	241,828	31,723	8,633	181,336
1929					
Jan.	32,705	11,055	2,018	325	11,567
Feb.	58,684	16,093	6,356	95	18,468
March	57,869	22,045	5,656	631	15,274
April	40,675	9,984	2,483	2,462	23,167
May	47,763	10,087	5,300	1,245	26,118
June	*45,918	6,890	5,444	1,003	*26,200
July	46,686	14,963	5,352	2,650	18,706
Total 7 mos.	330,300	91,117	32,609	8,411	139,500

*Revised.

Class I railroads of this country had 7681 locomotives in need of repair Aug. 1, or 13.4 per cent of the number on line, according to reports filed by the carriers with the car service division of the American railway association. This was a reduction of 544 compared with the number in need of repair July 15, when there were 8225 or 14.3 per cent.

Steel Castings in Gain

Washington, Aug. 27.—Bookings of commercial steel castings for July increased sharply over the low month of June and nearly doubled the July of 1928. Seven months figures as compared with the same period last year also show a large increase, according to the department of commerce. Comparisons follow:

	Bookings †Total net tons	Bookings Railway specialties	Production †Total net tons	Production Railway specialties
1928				
July	66,992	20,483	78,648	27,501
Total (7 mo.)	576,260	224,249	605,913	232,342
Aug.	81,286	25,171	87,742	27,157
Sept.	82,762	35,234	75,761	25,311
Oct.	78,860	26,736	87,952	29,471
Nov.	84,742	34,545	82,385	30,799
Dec.	96,373	43,928	82,203	26,484
Total	1,000,283	389,863	1,021,956	371,564
1929				
Jan.	124,313	64,809	93,413	35,689
Feb.	115,639	58,903	97,568	40,282
Mar.	130,836	60,743	115,163	49,562
April	144,616	75,625	121,941	53,458
May	113,329	44,919	127,189	58,636
June	*94,996	34,947	116,009	54,154
July	103,447	37,383	119,474	51,579
Total (7 mo.)	827,176	377,329	790,757	343,360

*Revised.

†For tonnage of miscellaneous castings deduct Railway Specialties from the total.

Pig Iron

(*Concluded from Page* 543)

iron are reported in nearby territory at $12.50, base, Birmingham, some with a barge rate of $5.20, including a Michigan interest's purchase of about 1000 tons. A Racine, Wis., melter is negotiating for 1000 to 1500 tons. Two merchant furnaces in this district down for repairs and relining are to be blown in soon.

Philadelphia, Aug. 27.—Pig iron demand is restricted to small and moderate lots and these are fairly numerous, making up a good total. Prices are unchanged.

Cincinnati, Aug. 27.—Reports received in the Cincinnati district that a leading southern furnace interest is sold up for the remainder of the year, with other reports that the surplus of southern pig iron has been reduced, contributed a firmer undertone to the pig iron market. Southern iron is being offered at $14, base, Birmingham, in this district, although in recent weeks lower figures were done. One lot of 800 tons to an undisclosed Indiana buyer was the largest sale in new business of northern iron which totaled about 5000 tons. Orders for less than 1000 tons of southern iron were booked.

St. Louis, Aug. 27.—The chief development in the pig iron situation in this district the past several days was the purchase of more than 10,000 tons of southern basic iron by the Keystone Steel & Wire Co. of Peoria, Ill. at $12, a gross ton, furnace. An option was taken on an additional large tonnage. Other foundry iron sales aggregate 4200 tons, of which the St. Louis Gas & Coke Corp. booked approximately 2400 tons. Southern blast furnaces accounted for the balance, except about 350 tons, which went to furnaces in the Chicago area. Prices are a shade easier.

Birmingham, Ala., Aug. 27.—Sales and shipments of pig iron exceed production, and furnace stacks are being reduced. Quotations are given as $14.50, base, in the local territory and $14 in competitive districts. Reports continue of concessions on the latter price. Production has been reduced and further curtailment is proposed. Iron is being shipped eastward and northward though tonnage is not up to expectations.

Toronto, Ont., Aug. 27.—Spot buying is in good volume in the Canadian pig iron markets. Melters are taking large tonnages on old contract, and the movement of merchant iron is holding at a high level. Inquiries are more numerous. Prices are firm.

Youngstown, O., Aug. 27.—Shipments of pig iron are going forward from blast furnaces to consumers steadily, this being true especially of basic and No. 2 foundry grades. The Republic Iron & Steel Co. has relighted its fourth Haselton stack, which has been out of blast for several weeks for relining, making all four of this group now blowing. New business in pig iron here is of routine character, being for small lots but for frequent shipment. Bessemer and malleable grades, which are in fair demand from foundries, are holding at $19, valley, while basic and No. 2 foundry is $18.50. Pig iron prices here appear as firm as at any time this year.

Sheets Continue Strong

(*Concluded from Page* 549)

erators, office, home and shop furniture. Automotive grades, except in a few cases, grow more quiet. Ford, Chevrolet, Chrysler, Buick and a few others are taking large tonnages, but Chevrolet is curtailing, as it works off stock preparatory to presenting a new model. Current buying is in small lots. Barrel and drum manufacturers continue fairly active and small portable tank makers utilizing blue annealed sheets take fair size lots. Black sheets can be had easily inside of three weeks; galvanized in four; blue annealed in six or eight in most cases. Where deliveries enter the fourth quarter, bookings are accepted at prices to be announced later, although no advance is expected.

Philadelphia, Aug. 27.—Sheet demand is good and bookings here in the past week with a number of mills fully equaled shipments. Prices are steady. Autobody makers have booked large new orders and are operating practically full. Anthracite operations have improved and some collieries now are on a 100 per cent basis for the first time this year.

Tariff Bill Ready for Senate; United States Value Plan Used

WASHINGTON, D. C., Aug. 27.—The senate finance committee has completed its work on the tariff bill. It finished the latter part of last week with the administrative features.

It has been stated that on the morning of Sept. 4 the full membership of the committee will meet formally to order the bill favorably reported, which will be done on that day. That is the date agreed upon by the Democrats and Republicans to start work on the tariff bill on the floor of the senate.

Unless something should turn up, which is not now contemplated, no changes will be made in either the rates of the bill or the administrative features before it is reported out of committee. That means that the rates already printed in this paper will stand, at least until the senate takes action.

Considerable misunderstanding seems to have developed in connection with the action taken by the finance committee with regard to the change in the valuation plan to the United States value plan, rather than the foreign, as is the case now, and as was provided for in the bill as it passed the house.

Should congress finally adopt the recommendations of the finance committee in this regard it will mean that the tariff commission will convert all of the ad valorem rates in the bill from foreign to United States value and then report back to congress. It does not even mean that congress would finally adopt that plan but the report is to be made and the commission has until 1932 in which to finish this work. In other words, the present foreign value plan will be effective until congress takes further action.

Under the original recommendation on the United States value plan, made by Senator Reed, Pennsylvania, the tariff commission was to have made a report to the President and he was to have issued a proclamation changing the rates from foreign to United States values. However, Senator Reed was forced to accept the amendment of Senator Couzens of Michigan, that the report be made to congress.

The United States value plan provides that the duty be assessed on the wholesale selling price of the imported article in this country. There is still confusion in the minds of some between the United States value plan to the so-called American value plan which has been advocated for a long time and which contemplated the assessment of duties on imports on a value equivalent to what a comparative article made in the United States would cost.

The finance committee also restored the bipartisan character to the tariff commission, which would have been changed under the house bill, and eliminated the language which would have made the secretary of the treasury's decision on valuation appeals final.

The house provision that differences in "conditions of competition" rather than "cost of production" should be the basis of executive exercise of the collectible power of revision, was also retained by the finance committee in principle, with some minor changes. The committee also retained the parts of the law allowing the President to fix tariffs under the flexible provisions.

Due to a typographical error in paragraph 352 of the tariff bill as printed on page 491 in the Aug. 22 issue of IRON TRADE REVIEW, causing some misunderstanding as to specific meaning, the paragraph is herewith reproduced correctly:

Par. 352. Twist and other drills, reamers, milling cutters, taps, dies, die heads, and metal cutting tools of all descriptions, and cutting edges or parts for use in such tools, composed of steel or substitutes for steel, all the foregoing, not specially provided for, 50 per centum ad valorem; if containing more than one tenth of 1 per centum of vanadium, or more than two tenths of 1 per centum of tungsten, molybdenum, or more than three tenths of 1 per centum of chromium, 60 per centum ad valorem. The foregoing rates shall apply whether or not the articles are imported separately or as parts of or attached to machines.

A typographical error occurred in the last line of paragraph 306 as printed on page 483 of the Aug. 22 issue. A comma should be inserted before the word "shall." The last two lines of the paragraph should read: . . . "excepting what is known as malleable-iron castings, shall be classed and denominated as steel."

New Lock Specifications

Washington, Aug. 27.—The federal specifications board, Washington, is promulgating new specifications for the purpose of padlocks by the government. Suggestions are requested by George K. Burgess, chairman of the board, within six weeks.

Manganese Producers To Meet at Washington

Tentative arrangements have been made for the annual convention of the American Manganese Producers association, to be held at Mayflower hotel, Washington, Sept. 9-10. Delegates will register at the hotel Monday morning Sept. 9, following which J. Carson Adkerson, president of the association, will welcome the delegates. On Monday afternoon an address will be given by Dr. Henry C. Knight, chief of the bureau of chemistry and soils, department of agriculture, Washington, who will speak on manganese in agriculture. A business meeting of the association will follow, and in the evening an informal dinner is scheduled at which Henry F. Ashurst, senator from Arizona, will preside.

The subject of the Tuesday morning session will be recent developments in manganese treatment, amplified by the presentation of three papers, "The Bradley Process," by Wilson Bradley, president, Bradley-Fitch Co.; "Flotation of Carbonate and Oxide Manganese Ores," by Will H. Coghill, superintendent, bureau of mines experiment station, Rolla, Mo.; and "New Processes," by Professor A. T. Sweet, Michigan College of Mining and Technology, Houghton, Mich. Tasker L. Oddie, senator from Nevada, will be the principal speaker at the Tuesday afternoon gathering, discussing the economic aspects of the manganese industry.

Gray Iron Institute To Hold Annual Meeting

Announcement of the annual meeting of the Gray Iron Institute Inc. at Hotel Cleveland, Cleveland, Oct. 16, has been made by Arthur J. Tuscany, manager of the organization, Terminal Tower building, Cleveland. The board of directors, committees and other groups will meet Oct. 15 and probably Oct. 14 as well.

The entire day of Oct. 16 will be given over to reports of officers, committee reports, and discussions of interest to the industry. Talks on merchandising, uniform accounting, trade practices, statistics, and research activities both marketing and technical, will be some of the subjects discussed. In the evening the annual dinner will be held.

Officials of the Oliver Farm Equipment Co., South Bend, Ind., recently told salesmen prospects for the company are excellent.

Shape Shipments Gain

Washington, Aug. 27.—Structural shape shipments for July gained slightly over June, according to the department of commerce. Figures for seven months as compared with the same period in 1928 also show a sharp gain. Monthly comparisons follow:

	—New orders—			Shipments
	Actual	% of	Computed	Computed
1928	tonnage	capacity	tonnage	capacity
July	247,343	77	296,450	265,650
Seven mos.		69	1,867,250	1,690,150
Aug.	295,431	92	354,200	288,750
Sept.	266,269	83	319,550	273,350
Oct.	210,454	65	250,250	319,550
Nov.	203,760	63	242,550	273,350
Dec.	207,499	64	246,400	281,050
Year.....	.....	71	3,280,200	3,126,200
1929				
Jan.	227,103	71	273,350	281,050
Feb.	222,723	70	269,500	238,700
Mar.*	296,343	93	358,050	277,200
Apr.*	†276,109	87	334,950	304,150
May*	‡281,364	89	342,650	311,850
June*	§279,724	89	342,650	292,600
July	¶277,119	91	350,350	304,150
Seven mos.		84	2,271,500	2,009,700

*Revised.
†Reported by 231 firms with a capacity of 317,430 tons.
‡Reported by 227 rms with a capacity of 314,370 tons.
§Reported by 218 firms with a capacity of 312,885 tons.
¶Reported by 193 rms with a capacity of 302,990 tons.

Malleable Output Is Low

Washington, Aug. 27.—July production of malleable castings was the lowest of any month this year, according to the department of commerce, but higher than July, 1928. Figures for the seven months period, compared with the same time last year, however, show a substantial gain. Monthly comparisons follow:

1928	Production net tons	Shipments net tons	Orders booked net tons	Per cent of capacity operated
July	60,290	60,084	60,964	63.1
Total (7 mos.)	455,164	445,312	444,973	67.4
Aug.	68,606	66,962	66,128	72.1
Sept.	62,665	61,736	61,163	66.3
Oct.	70,054	63,510	65,780	73.4
Nov.	63,560	58,346	59,664	66.8
Dec.	59,428	56,867	61,182	63.4
Total, year	779,477	752,733	758,890	67.9
1929				
Jan.	73,364	77,424	77,047	*77.9
Feb.*	73,875	71,093	77,976	77.1
March*	83,365	81,063	86,744	87.7
April*	83,765	*81,999	*80,808	*87.8
May*	81,705	80,535	76,927	83.8
June	72,512	72,608	65,377	75.2
July**	70,132	69,940	61,988	73.2
Total (7 mos.)	538,718	534,662	526,867	80.4

*Revised. **Preliminary.

To Hold Sectional Meets

Ohio Foundries Association Inc., through its board of administration, has abandoned plans for the annual convention which was to have taken the form this year of a boat trip on the Ohio river. Instead, four sectional meetings will be held in various parts of the state during the year. Luncheon, speakers and round table discussion will feature each one of these proposed gatherings. It is thought that in this manner a large number of foundrymen will derive the benefits of the association. The initial meeting will be held late in September or early in October at Toledo, O.

Carriers To Ask Delay in Putting I. C. C. Mileage Scales Into Effect

NEW YORK, Aug. 27.—Railroads in official classification territory —east of the Mississippi and north of the Ohio and Potomac rivers—are expected shortly to file a petition with the interstate commerce commission postponing the effective date of the commission's decree prescribing mileage rates for iron and steel products.

The decision of the commission, handed down June 24 and printed in IRON TRADE REVIEW for June 27, orders the mileage scales to be effective Oct. 20. This would compel the new tariffs to be filed with the commission not later than Sept. 20. The commission prescribed one scale for territory except New England, for New England a scale 10 per cent higher.

Railroads are expected to urge upon the commission the claim it is physically impossible to prepare the necessary tariffs by Sept. 20. Also, that in figuring direct route mileage it will be impossible to avoid fourth-section complications. It is reported, also that the carriers will seek reargument of the case, known as Docket 17,000, seeking among other things still higher short-haul rates.

Iron and steel consumers of northern New Jersey, meeting at Newark, N. J., Aug. 22, adopted a resolution asking that cities in northern New Jersey be placed on an actual mileage basis and be exempted from the special plan for the New York district laid down by the commission in its June 24 decision.

Cites Rates as Inflated

Denouncing the proposed freight increase to northern New Jersey plants as unjust and discriminatory, Milton P. Bauman, chairman of the New Jersey Traffic Advisory committee, described the rates to these New Jersey cities as inflated. He said that to a majority of the points from Pittsburgh there is an inflation of 20 cents a ton and that from Claymont, Del., 10 to 70 cents per ton, while for the short haul distance, of which Bethlehem is representative, the range is 10 to 30 cents at only the points grouped with New York, east of Hackensack river and Newark bay.

The actual distance from Pittsburgh to New York is 436 miles, for which the proposed scale calls for a rate of 33 cents. To Newark, the largest New Jersey city, the actual distance is 419 miles, for which the scale rate is 32 cents, but due to grouping with New York the prescribed rate is 33 cents. This, he charges, is an inflation of 20 cents per ton. In the case of the Magor Car Corp., Passaic, N. J., this alleged inflation will result in an added cost of $20,000 a year, should the new rates become effective as now proposed.

The traffic advisory committee took the position that this is unwarranted, particularly inasmuch as the straight scale will be applied elsewhere throughout the northern section of the United States and is unnecessary inasmuch, in its opinion, it does not aid New York to have Newark and other New Jersey cities grouped with it. The New York rate would still be 33 cents due to the extra distance.

Exports Not Affected

While the proposed rates do not apply to export shipments, they do apply to intercoastal trade. This, in view of the proposed rates from Pittsburgh and certain other leading producing iron and steel centers, to Baltimore and Philadelphia, will prove detrimental to the Port of Newark, it was pointed out, but no official protest was formulated. The new rates to these other two ports are favorable, as compared with the rates to New York, and in which the Port of Newark would share.

Under the proposed change the Pittsburgh-New York domestic and intercoastal rate will be 33 cents, the Philadelphia rate 29 cents, and the Baltimore rate 27 cents, reduction of 1, 3 and 4 cents in each case, respectively, and at the same time making for a difference between the New York and Baltimore rates of 6 cents, compared with 3 cents at present, and for a difference between the Philadelphia and Baltimore rates of 2 cents, as against the current differential of 1 cent. The rate differential between New York and Philadelphia under the proposed change will be 4 cents, against the present 2-cent differential.

National Air Races Emphasize Role of Industry In Aviation

Speed and Reliability of Aircraft Are Tribute To Materials, Sound Engineering and Painstaking Manufacturing Methods

Cleveland, Aug. 27.—With the numerous hangars at Cleveland airport filled to overflowing with visiting civilian, commercial and military planes, with the actual daily flights of the Goodyear blimps and the visit of the navy's all-metal dirigible—the ZMC-2, and the promised presence on Wednesday of the LOS ANGELES and the globe-encircling GRAF ZEPPELIN, this city for the moment is the aeronautical center of the universe.

This unrivaled concentration of aircraft—illustrating as it does the latest developments in man's efforts to conquer the air—affords the industrial-minded observer an excellent opportunity to seek answers to many questions that have arisen during the past few years.

"How," for instance, "will aeronautical activity influence the metal-working industries?" "To what extent will the manufacture of airplanes and dirigibles and the construction of manufacturing, service and operating plant and equipment affect the iron, steel and allied industries?"

Suggestions for answers to these and other questions abound in Cleveland this week. Activities at the Cleveland airport, where the National Air races are in progress, demonstrate what has been accomplished in the way of performance. There one may see what inventive genius, engineering skill, mechanical development and manufacturing ability have accomplished in winning the air. But it is in the seclusion of the hangars and in the exhibits at the Aeronautical Exposition at the public auditorium that one sees in detail the contributions of industry to aeronautics.

* * *

THE first impression—and one that gains strength the more carefully one examines the show—is that the aviation industry relies largely upon alloys of steel and aluminum for its important materials, that forgings are in evidence as much if not more than rolled and cast products, and that welding is the preferred method of fabrication for many parts.

After looking over the numerous airplane engines, one realizes the significance of the design by Charles L. Lawrence in 1914 of a radial air-cooled engine. This engine, exhibited at the show, was the forerunner of the "whirlwinds" of the Wright Aeronautical Corp. Today 80 per cent of aviation engines are of the air-cooled radial type.

Forgings play an important part in these engines. In most of them the cylinders are machined from carbon steel forgings, each weighing about 30 pounds. The Canton Drop Forging & Mfg. Co., Canton, O., which exhibited numerous rough cylinder forgings, is one of the leading producers of this product. Connecting rods, crankshafts, propeller hubs, and numerous other forgings exhibited by a dozen or more companies gave evidence of the importance of forgings in the manufacture of engines and planes. Among these companies are Endicott Forging & Mfg. Co., Endicott, N. Y.; Champion Machine & Forging Co.; Cleveland; Wyman-Gordon Co., Worcester, Mass.; Park Drop Forge Co., Cleveland; and the Ohio Crankshaft Co., Cleveland.

Alloy steels play an important part in the construction of airplane engines. A glance at specifications of a score or more of the models exhibited shows that chrome-nickel or chrome-vanadium steels are preferred for connecting rods and crankshafts, although in a number of cases forged duralumin rods of H-section are specified. Gears and cams are of chrome-nickel, chrome-vanadium, or carbon steel. Tungsten steel appears in the specifications for valves. Cylinder heads, pistons and crankcases usually are aluminum or aluminum alloy.

Propellers again illustrate the point that forgings are employed extensively in the airplane industry. The hubs are of chrome-vanadium steel, machined from forgings. The blades are of aluminum alloy forgings. The propellers of the Standard Steel Propeller Co. and Hamilton Aero Mfg. Co. conform to these specifications. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is demonstrating propellers with blades of Micarta, a material also used for pulleys, tail skid wheels, etc.

Producers of drawn steel and steel tubing are finding that aviation is a customer of great promise. Exhibits of the Union Drawn Steel Co., Beaver Falls, Pa.; Bourne-Fuller Co., Cleveland; Summerill Tubing Co., Bridgeport, Pa.; Ohio Seamless Tube Co., Shelby, O., and DeWalt Products Co., Leola, Pa., show the extent to which tubes and drawn bars and shapes are employed.

* * *

DURALUMIN appears prominently in the fuselages of many planes and in the construction of almost all of the seaplanes. In the form of corrugated sheets it is employed on Ford planes, and on numerous other craft, particularly of larger sizes. Edo Aircraft Corp., College Point, N. Y., displays aluminum floats for planes up to 5100 pounds. Aluminum sheet also is used for engine cowls, wheel fairings and other streamline fittings. The Hill Auto Body Metal Works, Cincinnati, exhibited interesting products of this type.

Pneumatic struts for landing gear employ steel forgings. Some of the larger units, having a piston diameter of 4¾-inches and extended length of 30 inches weigh 36 pounds each. This product is made by the Cleveland Pneumatic Tool Co., Cleveland.

The airplane industry has opened up a new field for screw machine products. The National Acme Co., Cleveland, displayed numerous samples of screws, bolts, studs, etc., developed for airplane use. Wire and cable are being demonstrated by the

Macwhyte Co., Kenosha, Wis., and John A. Roebling's Sons Co., Trenton, N. J.

Buildings for the airplane industry have attracted several notable engineering and material companies to the field. The Austin Co., Cleveland, has taken a leading role in the design and construction of these structures. H. H. Robertson Co., Pittsburgh, is installing its protected metal for sidings and roofs on many buildings in the aviation field.

The role of welding is illustrated in the exhibits of Linde Air Products Co. and Air Reduction Sales Co., New York, both of which are demonstrating gas welding.

The Texas Co., New York, is one of several companies which are demonstrating lubricants and gasoline.

* * *

IT IS evident that the design and construction of airplanes have settled into a positive, rapid stride. Production is established on a substantial basis.

However, this does not mean that the final word has been written on materials, design or construction. An alloy which seems firmly entrenched today may give way tomorrow to some other product. The aviation industry already is large enough and important enough to merit the attention of all producers of suitable materials and manufacturers of required equipment and supplies. The decision as to who shall win out in the race for aviation patronage depends largely on the degree to which each producer or manufacturer helps the new industry solve its technical problems.

How Metallurgy Meets Challenge

(*Concluded from Page* 525)

These types of steels have not only entered the field of the heavy chemical industry but have also found wide application in the preparation of foods, soft-drinks, cafeteria and kitchen equipment, laundry machinery and the like. The type containing 18 per cent chromium and 8 per cent nickel deserves special mention on account of its future possibilities in the chemical industry.

As special cases of high alloy steels for extreme conditions may be mentioned the European alloy B. t. g. and the alloy newly described by Field. The B. t. g. alloy has successfully met various extreme corrosion conditions and the Field alloy is supposed to withstand the action of hydrochloric acid, a great desideratum of the chemical engineer. These alloys have the following approximate analyses:

	B.T.G. (Per cent)	Field (Per cent)
Nickel	58	57
Tungsten	4	....
Manganese	1.5	3
Carbon plus Silicon	0.5	0.5
Iron	24	20
Chromium	12	....
Molybdenum	....	20

In order to give a general view of the field of metals applicable to the chemical industry, the accompanying table is presented not as a comprehensive list for selection of materials for specific purposes but only as a guide to the entire complex field. Also, the ordinary materials for structural purposes that are only resistant to atmospheric corrosion are not included.

In the treatment of refractory minerals, waste residues, metallurgical slags and the like, considerable attention has been devoted to the possibilities of recovering values by means of chlorination at high temperatures.

In many cases the designer and operator of chemical equipment can aid the metallurgist by not subjecting the materials of his equipment to unnecessary drastic service. In direct fired apparatus the oxidizing or reducing nature of his flame and the sulphur content of his fuel will be determinative factors in the life of the equipment. Uneven heating also helps to produce strains and incipient cracks which start corrosion and disintegration. In certain operations filtrates and waste liquors can be effectually neutralized by lime before feeding them to pumps or other equipment. The designer can also, by the selection of a little costlier material, assure more uninterrupted operation, balancing his original cost against replacement cost, interruption of service, lack of production and consequent loss of profits.

Improves Cutting Tools During Hardening

(*Concluded from Page* 520)

justed for the gas of a certain city to hold a neutral atmosphere, will prove a failure in some other city. All city gas has a relatively high hydrogen content, which will be increased materially by dissociation of the hydrocarbons at the heat treating temperature employed. Hydrogen is a decarburizer, and requires the presence of a definite amount of carburizing gas at any given temperature to restrain its injurious action.

The effect of dissociation, reckoned in carburizing operations, is often if not entirely overlooked when heat treating tool steels. Thus, for example, an injection of carburetted water gas may be used to create a neutral or slightly carburizing atmosphere. With regard to a high-carbon steel, 1 per cent carbon, for example, it is difficult to maintain a carbonaceous atmosphere of sufficient concentration to be carburizing even potentially. However, assuming that the carburetted water gas contains close to the high value, namely around 36 per cent carbon monoxide, let us see what happens.

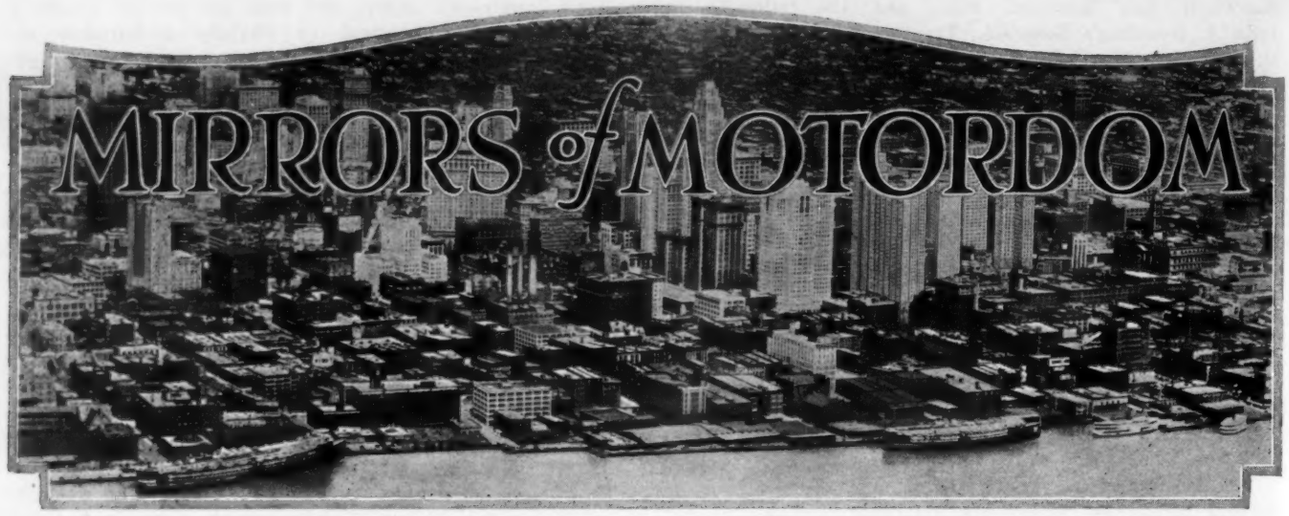
At temperatures exceeding 700 degrees Fahr. definite amounts of the carbon monoxide decompose into carbon and carbon dioxide. Should this decomposition occur before the gas enters the heating chamber, soot or carbon will be deposited in the gas pipes leading to the furnace, and carbon dioxide flow into the muffle. It will be accompanied by more or less undecomposed carbon monoxide. Nevertheless, the condition of the gas mixture will be one of carbon impoverishment. Having decomposed at a temperature below that of the heating chamber, when the gas mixture attains the temperature of the chamber it seeks equilibrium at that temperature. To accomplish this it must depend upon carbon. The steel tool is the only source of carbon available, hence it is decarburized.

Regulation Is Impossible

Such phenomena render the regulation of gaseous atmospheres difficult, but not impossible. We simply lack a target. Our observations have been obtained from the negative side; we recognize the atmospheres that are detrimental, but have not studied atmospheres of beneficial nature.

Tools of superior cutting qualities have been produced, at odd times, by the obsolete pack-hardening method. Neither temperature nor composition of gas is under control in this process; nevertheless, the occasional results of extraordinary merit indicate that there is a combination of rich carbonaceous gases, composed of carbon monoxide, hydrocarbons, and possibly some ammonia compounds more beneficial as a heating medium than the liquid bath.

It is not even remotely suggested that plain carbon steel tools can be endowed with the cutting qualities of special alloy steel tools, or of high-speed steel tools. In its class as regards quality and grade of steel, however, a given type of tool may have its average life increased by heating in gaseous atmospheres of appropriate nature. Increasing improvement in furnaces brings the question of atmospheric control closer to realization.



Falling Steel Orders Forecast Lower Auto Output

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New Models a Record; Steel Sellers Not Air-Minded

Detroit, Aug. 27

AUTOMOBILE production in August is rivaling the 500,331 passenger cars and trucks officially reported for July and by a fair margin will exceed the previous August record—461,298 units—set last year. With Buick and the Chrysler lines coming back strongly following the introduction of new models and Ford carrying on, there is a possibility that as in 1926, 1927 and 1928 August may even show a slight increase.

But for September the outlook is not so good. Specifications for steel were heavy late in July and early in August, anticipating this month's heavy runs, but the past ten days they have declined sharply. Makers of bars of all kinds, sheets, strips, wire, alloy steel and finished material generally have experienced a decided recession in demand. Less pig iron is moving to automotive foundries, and scrap is less buoyant than 30 days ago. The recession is comparative, however, as the general level of business holds well above a year ago.

The conviction is growing that the great bulk of 1929 automobile production is now behind the industry. A light September, a fair October, a poor November and a moderate pre-show recovery in December—that is the forecast here.

* * *

LET come what may, nothing can dull the luster of 1929. Granted that August production is approximating that of July, the industry will come up to Sept. 1 with an output of 4,225,000 units. The record was broken in 1928 with 4,358,759 units. Normally 60 to 70 per cent of the year's production is accomplished in the first seven months. Accordingly, the 1929 total should top 5,000,000 handily and perhaps threaten the 5,500,000-mark. March, April, May, June, July—and perhaps August—all have seen 500,000 units surpassed, and the previous record for any month was only 461,298. Not as many cars were made in all 1927 as in the opening seven months of 1929.

* * *

THE season means nothing to Ford. His daily production ranges from 8500 to over 9000, as operating conditions dictate. For a number of weeks Ford has not been gaining; neither has he been losing; and some believe he is at his peak. Ford specifications for steel have never been heavier, and as those of his rivals shrink his are the more noteworthy.

Chevrolet is not operating at more than one-half the Ford rate, averaging about 4000 daily. The year's goal for this make is 1,350,000 units. By Sept. 1 about 1,125,000 will have been made. Within 60 days it is believed production of this year's model will cease, and the new job may be out before show-time.

Buick is having one of the best months in its history, crossing 1200 units some days. It is running at the rate of 900 Buicks and 300 Marquettes. Hudson is not far from 1000 daily, despite the fact the run on the Hudson is about over. Pontiac's rate is 600 daily with Oakland now in the changeover period.

Chrysler is making daily about 250 each of the 70 and 77 models, 300 of the 66 model, 300 DeSotos, 600 to 700 Dodges, 800 to 900 Plymouths and 125 to 150 Dodge trucks. General Motors trucks is averaging 125 daily. Hupp is at 250 to 300 a day, Cadillac 75, La Salle 100, Packard 200 and Lincoln 40 to 50.

* * *

IT IS believed that the last half year will see a record number of new models introduced. Already Buick, Chrysler, Graham-Paige and Hupp have revised their lines. Nash and Packard are conducting clearance sales prior to their announcements. The new front-wheel drive Cord is appearing. Hudson is expected to show an eight-cylinder car for 1930. A 16-cylinder of the V type is looked for.

The new models are affecting consumption of steel little. The favored one-piece fender is shifting some business from strip mills to sheet mills. Most motors are larger, calling for heavier crankshafts. Ford is using more sheets and less fabric in the rear quarters of some models. Chrysler is broadening its use of welding in bodies.

While the front-wheel drive Cord is eliminating the long propeller shaft, the construction of the front is so much heavier that the aggregate steel consumption is greater. Cross-bracing of the frame is possible. There

are twice the number of universal joints and the front axle is heavier than the old rear type.

* * *

THEY raise their eyebrows at Fordson and Dearborn when Chevrolet's claim to being the world's largest automobile producer is mentioned, but prefer not to give the opposition the benefit of an argument.

Chevrolet claims to have turned out more cars since Jan. 1, 1927, than any other maker. That is true, as Ford was out of production most of 1927 and was slow getting started in 1928. Chevrolet made 1,000,000 sixes between last December and Aug. 5—undoubtedly a 6-cylinder record.

On July 23 Ford No. 2,000,000 rolled off the line. By Aug. 21 production had mounted to 2,183,003. Ford's August total will be close to 190,000 and that of Chevrolet about 140,000. Ford is just reaching his stride on Model A, while Chevrolet approaches a model change. Time is on the side of Ford, and if Chevrolet has any lead it is being overcome.

* * *

THE borough president of Brooklyn, N. Y., was quoted recently as intending to ask the Ford Motor Co. to assist in removing its junked models, which were becoming burdensome to the community. If such a request does come, the response of the Ford company will be in the following vein:

"When the coal dealer collects the ashes, when the butcher and the grocer remove the garbage, when the newspapers and magazines call for the waste paper—then we'll remove our wrecks."

* * *

LAST year 4346 air, sea and amphibian planes were made in the United States; in the same period automobile manufacturers, chiefly in Michigan, assembled 4,358,759 passenger cars and trucks. This year it is estimated 7000 planes will be turned out; it is a slim day now when Ford alone does not complete more than 9000 motors.

With tonnage its driving force, it is obvious why the steel industry, comprising both local production and sales representation of outside producers, is not air-minded. Such names as Ford, Stout, Stinson, Packard, Mayo and Warner may add glamor to the Michigan airplane industry but they enter little tonnage on steel mill order books.

Less than one-third of the motors and planes completed in the United States in 1928 originated in the district embracing Michigan, Ohio, Indiana, Illinois and Wisconsin. Although many automobile manufacturers are experimenting with airplane motors and Packard is making headway with the diesel principle, few power plants are built here. Ford, like most other plane builders, imports his motors from the East.

Of the large outside producers of steel, a canvass reveals not one making a direct bid for airplane business. Some cold-finished steel bought by parts makers doubtless finds its way into the air but it is not distinguishable from automobile material. Some tubing, including that made locally, is sold to plane makers.

However, for the housing of planes, which fall more properly in the construction than the airplane industry, the steel industry extends itself. The Detroit municipal hangar, recently let, required 2825 tons of structurals, including 10-inch wide flange sections. A manufacturer of a special light beam has been pushing it for purlins, a 4-plane hangar taking about 14 tons. For a government hangar at Selfridge Field, 110 x 240 feet with 9-inch brick walls, 228 tons of structural steel was used. In this department of the airplane industry steel producers visualize their best outlet.

It is estimated that the weight of steel in a Ford, smallest of automobiles, is about twice that in the average airplane. On this basis, Ford alone consumes more steel in a half day than the entire airplane industry in a whole year.

Ford, whose production of planes has been increased to one a day, finds the employment problem vexing. Most of the air-minded young men of the country are insistent on attaching themselves to him. Men of means, convinced there is a future in the air, bring their sons to Ford, offering to let them work a year for nothing merely to get Ford experience.

Aeronautical Session at Chemical Meeting

A special session of the fall meeting of the American Electrochemical society will be devoted to contributions of electrochemistry to aeronautics. The meeting will be in Pittsburgh, Sept. 19-21, at the William Penn hotel. The list of speakers at the aeronautical session will include Edward P. Warner, editor of *Aviation* and Dr. George W. Lewis, director of aeronautical research, National Advisory Committee for Aeronautics. The electrothermic session of the society will meet in special session the morning of Sept. 20, at which time the subject, "Recent Developments in the Annealing of Nonferrous Metals," will be introduced by Robert M. Keeney, Connecticut Light & Power Co. Chromium plating processes will come for a large share of the discussion at a session of the electrodeposition division of the society. A number of interesting inspection trips have been arranged, one to an electric steel plant and another to a plant where steel bumper bars are chromium plated.

July Auto Production Off But Makes Record

Washington, Aug. 27.—July production of automobiles in the United States and Canada was the highest of any July in the history of the industry, although it declined sharply from June. In the United States 500,331 cars and trucks were made, while the Canadian output was 17,461 units, according to the department of commerce. Monthly comparisons follow:

	United States			Canada†
1928	Total	Passenger cars(1)	Trucks	Total
July	392,086	338,792	53,294	25,226
Total, 7 mo.	2,593,607	2,301,199	288,835	150,214
Aug.	461,298	400,593	60,705	31,245
Sept.	415,314	358,891	56,423	21,193
Oct.	397,284	340,146	57,138	18,536
Nov.	*257,140	217,454	*39,686	11,769
Dec.	*234,116	205,993	*28,123	9,425
Total, year	*4,358,759	3,827,849	*530,910	242,382
1929				
Jan.	401,036	347,382	51,590	21,501
Feb.	466,352	405,708	58,536	31,287
Mar.	*585,222	*513,344	*69,799	40,621
April	621,336	537,225	82,425	41,901
May	*604,071	516,055	*86,698	31,559
June	*545,375	*452,624	*91,373	21,492
July	500,331	426,159	73,118	17,461
Total, 7 mo.	3,723,723	3,198,497	513,539	205,822

*Revised. (1)Includes taxicabs. †Reported by dominion bureau of statistics.

Canada Buys Farm Tools

An increase of $1,281,321 in exports of farm implements to Canada was noted for the first six months of 1929, as compared with a similar period of last year, according to George Bell, chief of the agricultural implements division of the department of commerce. It is believed that approximately three-fourths of this equipment will be used in the prairie provinces of Manitoba, Saskatchewan and Alberta.

For the half-year period of 1929, cut of a world total of $72,068,572, Canada received machinery amounting to $24,699,919, as compared with $23,418,598 for a like period in 1928, out of a world total of $54,011,857. The entire amount shipped to Canada for the whole of 1928 is placed at $46,131,912, out of a world total of $116,524,084.

July Foreign Trade in Strong Gain

Exports for Seven Months Above 1928 Period But Imports Are Less—Canada Best Buyer—Most Exports to American Countries

EXPORTS of iron and steel products from the United States in July, for the first time in two months, showed an increased trade in comparison with that of the preceding month. The gain amounted to 22,721 gross tons, or 9.1 per cent, and brought the total shipments of the month up to 270,532 tons, the fourth highest figure of the year. Imports were also increasing, the gain in this phase of the trade amounting to 7,743 tons, or 12.1 per cent, and bring the total for the month up to 71,378 tons.

The foregoing increases were strongly reflected in the average daily trade of the month—the daily export average for July being 8724 tons in contrast with that of June, 8260 tons, and that of April, the peak month of 1929, 9253 tons. The import trade presents a similar picture with a July average of 2302 tons against that of June, 2121 tons, and that of May 2396 tons.

IMPORTS AND EXPORTS

Gross Tons

	—1929—		—1928—	
	Imports	Exports	Imports	Exports
Jan.	54,793	274,296	58,635	205,766
Feb.	58,146	259,711	48,756	185,907
March	52,622	270,925	74,128	221,935
April	54,337	277,580	71,579	215,184
May	74,272	291,516	72,106	267,890
June	63,635	247,811	65,819	262,052
July	71,378	270,532	47,830	253,336
7 mos.	429,223	1,862,372	441,558	1,610,698
Aug.	.....	.....	69,914	287,297
Sept.	.....	.....	57,782	228,056
Oct.	.....	.....	63,880	256,870
Nov.	.....	.....	67,103	256,886
Dec.	.....	.....	55,199	221,810
Total	.....	.....	782,694	2,862,997

The cumulative export trade, by reason of these same advances totals 1,862,371 tons against 1,610,767 tons for the first seven months of 1928—a gain of 251,604 tons. Here the similarity ends, however, for despite the gain in the July import trade the cumulative activity of 1929, 429,223 tons, is 18,432 tons less than that of 1928, 447,655 tons. The average daily movement over this elapsed period compares favorably with the monthly figures in the preceding paragraph—the 1929 average being 8785 tons of exports and 2025 tons of imports, whereas the 1928 figures are, respectively, 7562 tons and 2102 tons.

As noted above, exports of iron and steel products were 22,721 tons greater in July than in June—the month's total being 7,000 tons under the high figure for 1929 and being the first instance since April that this trade has presented a truly favorable picture. Twenty-five classes of products participated in the increase against 17 showing losses. The largest single gain was that in steel bars (4934 tons), although slightly smaller gains in pig iron, scrap, wire rods, and fabricated structural shapes helped to swell the total. Against these were losses in the shipments of ingots (2963 tons), rails, casing and oil line pipe, hoops, and plain structural shapes.

Canada was the principal purchaser of each of the five major products in the July trade, a quarter of the scrap exported went there, although Italy, Japan and Poland were also large purchasers; nearly 90 per cent of the plain shapes followed and the same may be said of the trade in boiler and other plates; a third of the black steel sheets found their way to Canadian markets despite large tonnages which were shipped to Japan for galvanizing and to France to be made into automobile bodies; while half of the steel bars were also shipped to Canada, lesser tonnages going to the United Kingdom and Japan.

Fifty-three per cent of the exported iron and steel shipped to oversea consumers in July went to countries in North and Central America and the

ORIGIN OF PIG IRON IMPORTS

Gross Tons

From	July	June
France	.....	101
Netherlands	818	3,600
Norway	.....	464
Sweden	306	200
United Kingdom	412	3,040
Canada	54	49
Mexico	33	39
British India	5,120	3,903
Total	6,743	11,396

ORIGIN OF FERROMANGANESE IMPORTS

Gross Tons

From	July	June
France	55	116
Germany	.....	100
Norway	1,212	1,164
United Kingdom	1,077	1,261
Canada	2,999	2,629
Italy	70	237
Sweden	.....	36
Total	5,213	5,534

ORIGIN OF MANGANESE IMPORTS

Gross Tons

From	July	June
Soviet Russia in Europe	41,355	22,547
Canada	37	2,325
Brazil	4,077	21,253
British India	2,844	4,880
Java and Madura	.....	285
Italy	60	.....
Germany	21	.....
United Kingdom	12	.....
Total	48,406	51,290

ORIGIN OF IRON ORE IMPORTS

Gross Tons

From	July	June
Sweden	.....	27,331
Spain	18	6,797
Greece	.....	7,400
Canada	2,051	298
Cuba	68,450	50,000
Chile	140,192	126,590
Algeria and Tunis	11,750	12,930
Australia	8,042	4,007
Egypt	10,200	8,560
Brazil	7,400	.....
Newfoundland	10,500	.....
Total	301,418	243,913

ORIGIN OF IMPORTS

Gross Tons

	Ingots, blooms, etc.	Steel scrap	Cast iron pipe	Steel bars
Belgium	1,995	.....	.....	682
France	1,111	.....	6,213	407
United Kingdom	5	18	.....	93
Canada	2	8,607	.....	2
Germany	83	75	170	359
Sweden	323	59	.....	1,550
Italy	.....	147	.....	.....
Norway	.....	.....	.....	3
Total	3,519	9,101	6,383	3,209

IMPORTS OF IRON AND STEEL PRODUCTS

(In gross tons)

Item	July 1929	June 1929	January through July 1929	January through July 1928
Pig iron	6,743	11,396	80,204	81,350
Ferromanganese and alloys (1)	5,213	5,534	37,797	27,296
Ferrosilicon (2)	1,079	561	5,216	2,043
Ferrochrome (3)	142	20	382	396
Scrap	9,101	6,658	52,374	26,532
Steel, ingots, blooms, billets, etc	3,519	1,671	15,902	13,088
Steel bars	3,209	3,170	21,481	55,338
Iron bars	127	672	2,110	1,386
Wire rods	1,242	1,336	9,838	10,012
Hoops, bands, and scrolls	6,770	3,245	21,448	21,495
Boiler and other plate	34	72	2,456	3,355
Sheets, skelp and sawplate	2,818	2,266	13,248	15,999
Tin plate	31	27	173	751
Structural shapes	18,247	12,274	87,354	100,034
Rails and splice bars	1,067	1,332	4,127	11,180
Cast iron pipe	6,383	6,679	32,657	39,248
Other pipe and tubes	3,192	4,032	25,248	23,973
Barbed wire	577	612	3,542	1,975
Round iron and steel wire	490	295	3,756	2,440
Steel telegraph and telephone wire	.....	.....	.....	153
Flat wire and strip steel	137	162	1,240	1,339
Wire rope and strand	247	256	1,511	971
Other wire	17	85	366	320
Nails, tacks, and staples	800	1,079	5,340	4,863
Bolts, nuts, rivets, and washers	29	32	165	154
Castings and forgings	164	169	1,288	1,964
Total	71,378	63,635	429,223	447,655

(1) Manganese content. (2) Silicon content. (3) Chromium content.

West Indies, a proportion which compares favorably with the 51.5 per cent participation which they have enjoyed over the elapsed seven months of 1929

Shipments to the Philippine Islands were highly diversified with galvanized sheets the major item; Italy's purchases were almost completely scrap; Brazil took principally of galvanized sheets and barbed wire; Poland's purchases were entirely, with the exception of a single ton of "other" nails, of scrap; while Argentina's heaviest purchases were of rails weighing more than 50 pounds to the yard and tin plate.

For the first time in many months Belgium occupied the position of chief source of imports, her total of 15,497 tons being made up almost entirely of structural shapes, hoops, and steel ingots. France was second with 13,556 tons, cast iron pipe, ingots, and hoops being the principal factors in her total. About two-thirds of the Canadian total of 13,305 tons was scrap with ferromanganese accounting for about a quarter. The German total of 13,153 tons was composed of shapes, sheets, other pipe, and hoops, the tonnages of each decreasing in the order given.

DESTINATION OF JULY IRON AND STEEL EXPORTS

(In gross tons)

To	Rails	Galvanized sheets	Plates not fab.	Tin, terne plate	Black sheets	Barbed wire	Steel bars	Steel scrap
Argentina	1,857	468	52	997	514	456	.....	.....
Australia	.....	29	8	.....	647	66	245	.....
Brazil	546	1,796	2	393	.....	1,102	41	.....
Canada	1,128	2,546	16,931	4,334	7,559	131	8,433	11,281
Central America	179	449	70	.....	15	487	391	.....
Chile	1,609	76	117	458	926	.....	.....	.....
China	1	387	.....	2,737	644	.....	5	563
Colombia	53	387	4	72	.....	237	370	.....
Cuba	235	465	44	511	.....	428	397	.....
France	.....	.....	.....	.....	3,345	.....	.....	.....
Italy	.....	.....	.....	670	.....	.....	.....	9,609
Japan	175	99	729	1,994	3,624	.....	2,265	8,861
Mexico	1,415	1,072	450	1,367	106	716	341	2,007
Philippines	1,887	3,302	.....	703	42	849	999	269
Peru	46	.....	169	932	117	.....	381	.....
United Kingdom	.....	.....	.....	.....	68	.....	2,688	297
Venezuela	487	.....	.....	21	.....	204	.....	.....

Miscellaneous: Steel scrap, Germany, 4,900; Poland, 6,633; Spain, 2,347; Panama, 1; Hong Kong, 17; Kwantung, 233. Tin and terne plate, Other Europe, 14; Dutch West Indies, 40; Uruguay, 46; Turkey, 359; Java and Madura, 656. Galvanized sheets, Norway, 77; Other Europe, 175; Java, 1,057; Persia, 110; British India, 247; Dutch East Indies, 663; British South Africa, 27.

Plates not fab., Europe, 62. Black sheets, Europe, 147 Hong Kong, 138. Steel bars, Europe, 31.

Total	9,999	14,154	19,010	16,875	18,259	5,223	17,183	47,018

EXPORTS OF IRON AND STEEL PRODUCTS

(In gross tons)

Item	July 1929	June 1929	January through July 1929	January through July 1928
Pig iron, not including ferro-alloys	7,777	3,101	38,567	33,927
Ferromanganese and spiegeleisen	40	104	1,053	5,998
Scrap	47,018	42,816	296,738	295,063
Ingots, blooms, etc	1,236	4,199	26,287	11,240
Skelp	13,976	13,674	67,771	61,636
Iron bars	167	171	2,921	2,314
Steel bars	17,183	12,249	129,803	84,563
Alloy steel bars	547	931	11,947	8,594
Wire rods	5,822	2,774	28,882	22,167
Plates	19,675	17,640	126,971	86,374
Galvanized sheets	14,154	12,604	100,574	90,466
Black steel sheets	18,259	15,718	111,022	109,411
Black iron sheets	1,428	1,373	9,073	8,843
Hoops, bands and strip steel	4,734	6,275	47,592	32,684
Tin plate, terne-plate, etc	16,875	18,041	152,996	146,627
Structural shapes, plain material	29,946	31,268	175,812	104,406
Structural shapes, fabricated	10,392	7,363	65,063	54,417
Metal lath	544	541	3,604	2,816
Steel rails	9,999	7,389	95,565	120,203
Rail fastenings, switches, frogs, etc	3,102	3,223	20,149	30,078
Boiler tubes	1,746	1,286	11,306	9,931
Casing and oil line pipe	6,447	8,509	79,421	64,632
Black and galvanized welded pipe	14,880	12,572	83,664	65,337
Malleable iron screwed pipe fittings	1,070	1,143	7,361	5,526
Cast iron screwed pipe fittings	1,704	945	7,688	3,655
Cast iron pressure pipe and fittings	1,013	1,430	6,479	7,385
Cast iron soil pipe and fittings	1,132	1,042	6,777	8,810
Plain wire	3,591	3,789	29,728	26,936
Barbed wire and woven wire fencing	5,695	6,395	41,383	43,963
Wire cloth and screening	125	150	1,037	1,065
Wire rope	736	738	4,658	2,964
Insulated wire and cable	56	45	650	372
Other wire and manufactures of	1,258	1,017	7,049	5,464
Wire nails	1,352	952	9,210	10,032
Nails other than wire	962	868	5,968	5,641
Tacks	71	60	414	454
Horseshoes	37	45	220	269
Bolts, nuts, rivets, except track	1,232	1,206	9,359	7,762
Car wheels and axles	1,645	1,448	14,112	8,552
Iron castings	901	815	7,980	7,713
Steel castings	966	1,239	7,265	6,337
Forgings	1,039	663	8,252	6,140
Total	270,532	247,811	1,862,371	1,610,767

DESTINATION OF IRON AND STEEL EXPORTS, JULY, 1929

(In gross tons)

Country of Destination	July 1929	June 1929	Jan. thru July 1929	Jan. thru July 1928
North & Central America and West Indies	143,303	139,449	958,054	772,689
Canada and Newfoundland	118,163	117,056	793,777	636,192
Cuba	5,847	4,624	42,199	37,535
Guatemala	949	335	4,776	6,099
Honduras	495	736	7,222	4,459
Mexico	11,906	10,876	57,991	46,796
Panama	780	1,040	11,001	9,756
Salvador	462	234	4,675	2,218
British West Indies	697	1,662	13,082	4,881
Other West Indies	3,006	2,127	17,390	19,383
Other Central America	998	759	5,941	5,370
South America	28,701	27,026	244,022	255,716
Argentina	6,421	8,420	60,208	57,746
Brazil	6,739	4,681	40,255	50,835
Chile	5,074	2,879	36,915	40,282
Colombia	2,725	2,723	27,455	42,597
Peru	3,076	2,365	20,748	14,290
Uruguay	381	374	5,822	5,438
Venezuela	4,024	5,189	49,337	41,139
Other South America	261	395	3,282	3,389
Europe	36,905	31,599	229,557	181,973
Belgium	149	165	1,949	8,987
France	3,636	1,564	13,490	2,939
Germany	5,017	766	17,741	20,607
Italy	10,333	10,495	74,765	52,375
Netherlands	226	168	1,740	1,432
Poland and Danzig	6,634	7,406	54,396	45,805
Rumania	479	182	2,284	2,933
Soviet Russia in Europe	131	159	2,243	1,976
United Kingdom	6,005	5,455	37,316	31,464
Other Europe	4,295	5,239	23,633	13,455
Far East	59,388	46,982	416,906	391,346
British Malaya	382	85	4,790	3,856
China	4,740	4,587	46,091	64,258
Netherlands East Indies	7,452	3,269	44,273	17,741
India and Ceylon	382	1,440	11,628	14,326
Japan	31,330	27,558	218,072	214,541
Kwantung	617	609	8,488	4,479
Philippine Is.	11,302	5,078	58,353	55,226
Australia	2,116	2,593	13,563	9,195
New Zealand	142	226	2,937	1,211
Other Asia and Far E. Markets	925	1,537	8,711	6,513
Africa	2,235	2,755	13,832	9,043
U. of S. Africa	1,168	1,029	5,361	3,813
Egypt	585	1,100	5,780	3,411
Mozambique	328	288	1,432	790
Other Africa	154	338	1,259	1,029

Exports of Metalworking Machinery

(In number except where otherwise specified)

	July 1929	July 1928	Jan. through July 1929	Jan. through July 1928
Engine lathes	72	52	519	469
Turret lathes	43	36	325	265
Other lathes	65	106	554	456
Vertical boring mills and chucking machines	20	5	158	61
Thread-cutting and automatic screw machines	114	65	591	509
Knee and column type milling machines	24	28	254	203
Other milling machines	44	62	421	432
Gear-cutting machines	55	35	303	227
Vertical drilling machines	40	97	255	369
Radial drilling machines	10	6	73	86
Other drilling machines	451	381	1,373	808
Planers and shapers	41	24	301	250
Surface grinding machines	28	.....	143	.....
External cylindrical grinding machines	76	99	485	569
Internal grinding machines	29	89	279	289
Tool grinding, cutter grinding, and universal grinding machines	96	55	937	380
Pneumatic portable tools	2,844	1,815	15,134	12,581
Chucks for machine tools	2,545	2,426	12,662	9,481

Industrial Men in the Day's News

George H. Houston, President, Baldwin Locomotive Works, Philadelphia

MACHINE tools, steam engines, plate presses and benders, vacuum pumps, boilers, stacks, iron and steel metal work, gray iron castings, industrial engineering, aircraft, ball bearings and finally locomotives all have had his attention.

FIVE years from 1922 to 1927 he spent in the reorganization of sugar properties in the West Indies.

BEING but 46 years of age, he joins the ever-increasing ranks of younger executives for large industrial enterprises.

WHEN in the early 90's a young man named George Harrison Houston was serving his time as an apprentice in the shops of the Houston, Stanwood & Gamble Co., Cincinnati, he little knew he ultimately would occupy the president's chair of the world famous locomotive building company, Baldwin Locomotive Works, Philadelphia. He was elected to that office in March of this year in succession to Samuel M. Vauclain, who then was made chairman of the board. Shortly thereafter he too was elected president of the Standard Steel Works, a Baldwin subsidiary, of which Mr. Vauclain also became chairman of the board.

In those Cincinnati shops of the Houston, Stanwood & Gamble Co., the locale for his initial work after leaving school, Mr. Houston gained experience on lathes, machine tools, steam engines, plate presses and benders, vacuum pumps, boilers, stacks, as well as iron and steel sheet metal work and gray iron castings. He was born at Covington, Ky., Jan. 4, 1883, and was educated in the public schools of Cincinnati as well as in the Cincinnati technical school, now part of the University of Cincinnati. Before he left the Houston, Stanwood & Gamble Co., he had served as shop foreman, plant superintendent and works manager, his rapid rise attesting his ability with machinery, materials and men.

From 1910 to 1915 he was employed as works manager at the Root & Vandervoort Engineering Co. plant, Moline, Ill. In the latter year he located in New York, where with Charles Jamieson, he started an industrial engineering establishment under the name of Jamieson & Houston. It later was joined by one organized by Gen. George W. Goethals of Panama Canal fame, and the consolidated company operated under the name of George W. Goethals & Co.

In 1916, Mr. Houston reorganized the Curtiss Aeroplane & Motor Co.; in 1917 he became president of the Wright-Martin Aircraft Co.; in 1919 he organized and became first president of the Wright Aeronautical Corp., and in 1920 he was elected president of the Marlin-Rockwell Corp., 366 Madison avenue, New York, with plants for ball bearing manufacture at Plainville, Conn., and Philadelphia.

For five years from 1922 he was engaged in the reorganization of sugar properties in the West Indies. For a time he was associated with the Fisher brothers of Detroit in various automotive enterprises but this year after such a varied career, he entered the locomotive manufacturing industry as president of the Baldwin Locomotive Works and subsidiaries.

Men of the Industry

I F. BAKER, power division sales manager of the Westinghouse Electric International Co., New York, has been appointed European sales manager of the Westinghouse Electric International Co. with headquarters at 2 Norfolk street, Strand, London, Eng. In 1909 Mr. Baker commenced with the Westinghouse company on its apprenticeship course and in 1910 was graduated to the industrial sales department at East Pittsburgh. In 1913 when he was transferred to the Westinghouse Export Co., East Pittsburgh, and in 1918 to the New York office of the Westinghouse Electric International Co. as commercial engineer. The following year he was sent to Japan as manager for that country. In 1925 he was appointed managing director of the Japan company, holding that position until 1927. His appointment as manager of the Far Eastern department of the Westinghouse Electric International Co. brought him back to the New York office and a short time later he was made power division manager.

* * *

Mathew J. Carney, vice president of the Union Carbide & Carbon Corp., New York, has been elected a director of the corporation.

* * *

J. D. Wiggins has been appointed superintendent of T. L. Smith Co., Milwaukee, concrete mixer and paver manufacturer. He succeeded Walter Mickelson.

* * *

Joseph H. Dillon has been appointed chief engineer of the Wisconsin Steel works of the International Harvester Co. Inc., South Chicago, Ill. He succeeds William Forsstrom, resigned.

* * *

D. A. Rebillot has been appointed purchasing agent of the United Metal Products Co., Canton, O., to succeed C. E. Houck, who as noted recently, is now purchasing agent for the North American Refractories Co., Cleveland.

* * *

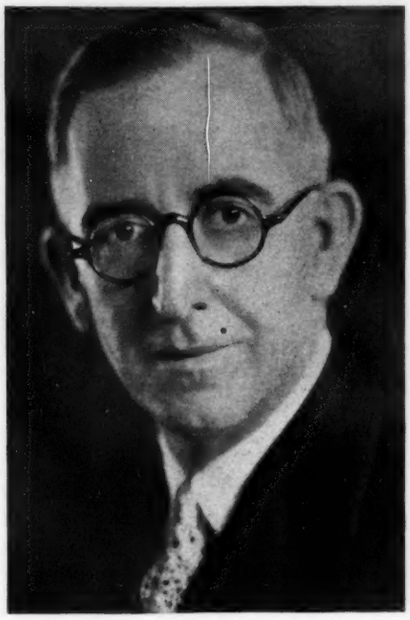
Roland M. Cook, formerly president of the Boston Pressed Metal Co., 171 Union street, Worcester, Mass., is now affiliated with the sales organization of the Worcester Pressed Steel Co., 100 Barber avenue, Worcester.

* * *

Thomas L. Thomas, formerly of the McKay Machine Co., now is manager of the machine department of the Youngstown Foundry & Machine Co., in charge of production and sale of sheet stretcher levelers, sheet roller levelers, oilers, scrubbers, etc.

* * *

Thomas D. Crowley, head of Thomas D. Crowley & Co., 8 South Michigan avenue, Chicago, has been appointed special railway sales representative in the United States for the complete line of cranes, shovels, draglines, and buckets of the Orton Crane & Shovel Co., 608 South Dearborn street, Chicago, and Huntington, Ind.



THOMAS D. CROWLEY

Mr. Crowley has been identified with the railroad industry for more than 25 years. He was roadmaster and later supervisor of materials for the Chicago & North Western railroad. In 1914 he became identified with the sales department of the Sellers Mfg. Co. but resigned in 1922 to organize his own company to handle railway equipment. He formerly was sales agent for the Cullen-Friestedt Co.

* * *

John W. Moon, Butler, Pa., has been elected chairman of the board of Fritz-Moon Tube Co., since the company was taken over by the Republic Iron & Steel Co. recently. Mr. Moon, who with Mr. Fritz obtained the mall-tube welding patents that go with the company, formerly was with the Youngstown Sheet & Tube Co. in the tube department. With Mr. Fritz, he founded the Fritz-Moon Tube Co. seven years ago.

* * *

S. S. Fox has been placed in charge of the Detroit office in the General Motors building, of the Joseph Schonthal Co., Columbus, O., scrap iron and steel dealer, as resident manager. W. R. Collard has been appointed assistant manager.

* * *

C. W. Messinger, for several years purchasing agent for the Edward G. Budd Mfg. Co., Philadelphia, was recently elected assistant treasurer of the company instead of treasurer as inadvertently noted on page 285 of the Aug. 1 issue of IRON TRADE REVIEW.

* * *

M. E. Finck has been elected secretary of the Murray Iron Works Co., Burlington, Iowa, engineer, founder and boiler maker. He succeeds the late C. H. Schroder. Miss M. R. Nairn has been elected assistant secretary and treasurer to succeed Mr. Finck.

* * *

Fred M. Cross, manager of the pneumatic tool sales department of the Chicago office, Ingersoll-Rand Co., 11 Broadway, New York, has been promoted to assistant general manager of pneumatic tool sales, with headquarters in New York. D. W. Zimmerman succeeds Mr. Cross at Chicago.

* * *

J. F. Lincoln, president of the Lincoln Electric Co., Cleveland, sailed recently for London, Eng., where he will be in charge of a demonstration before European engineers of his company's process of carbon arc welding. The exhibition will take place at the Allen Liversidge plant at the invitation of numerous engineers and manufacturers from all parts of Europe.

* * *

Dr. Richard Moldenke will address the St. Louis District Foundrymen's club at its monthly meeting at St. Louis, Sept. 13. In addition the invitations issued to the regular members of the club, invitations have been sent to foundrymen in neighboring cities.

* * *

James E. Stacy, president of the

Stacy Bros. Co., Cincinnati, has been made president of the Stacey Engine Ring Corp., a holding company organized to control a number of industrial concerns. Carmi Thompson, Cleveland, Beeman G. Dawes, of the Pure Oil Co. and Fletcher S. Heath of the same company, also are interested. The company will control Stacey Bros. Gas Corp., Cincinnati; Connersville Blower Co., Connersville, Ind., and the Wilberham Green Co., Pottstown, Pa.

* * *

James C. Alley, New York, pig iron and coke merchant, and his son, John L. Alley, returned Aug. 28 from a six weeks' visit to England, Scotland and Ireland.

* * *

E. I. Evans, formerly associated with the Worth Steel Co., Claymont, Del., latterly for 11 years as open-hearth superintendent, now is open-hearth superintendent of the Bourne-Fuller Co., Cleveland.

* * *

J. C. Taney, affiliated with the Autocar Co., Ardmore, Pa., for a number of years, has been elected senior vice president. H. M. Coale has been made vice president in charge of sales and B. B. Bachman is vice president in charge of engineering. W. H. Brearley has been made secretary.

* * *

E. Dana Shaw, formerly manager of the H. V. Morse Inc. and also formerly associated with the Morse Rogers Steel Co., now is affiliated with the Decker-Reichert Steel Co., 429 Terminal Tower building, Cleveland. Its new sheet, strip, tin, and terne plate, warehouse will be ready about Sept. 1.

James W. Reichert, son of J. F. Reichert, who resigned as president of the J. M. & L. A. Osborn Co., to organize the Decker-Reichert company, also is affiliated with the company.

* * *

E. L. Cord, president of the Auburn Automobile Co., Auburn, Ind., becomes also chairman of the board of the Columbia Axle Co., Cleveland, acquired recently by him.

Edwin H. Parkhurst, formerly vice president and general manager of the Columbia company, now is president.

W. R. Hopkins and Ben F. Hopkins, who controlled the Columbia company and who were president and secretary-treasurer, respectively, retire from the board but retain a substantial interest.

R. E. Fries and F. H. Ragan have been elected vice presidents in charge of sales and plant, respectively.

* * *

K. L. Griffith was formally elected president of the Seneca Iron & Steel Co., Buffalo, manufacturer of steel sheets, at the annual board of directors' meeting Aug. 15. He succeeds the late Hugh Kennedy, whose death was noted in IRON TRADE REVIEW of May 30.

James Paterson and Clifford Hubbell were elected vice presidents; Alex Paterson was elected treasurer; and T. W. Paterson, secretary.

The board of directors in addition

K. L. GRIFFITH

to the above, includes Frank H. Kennedy of Youngstown, O., and Walter P. Cooke, Buffalo.

Obituaries

ALFRED HUTCHINSON COWLES, 72, metallurgist and president of the Electric Smelting & Aluminum Co., Lockport, N. Y., died at his home in Sewaren, N. J., Aug. 14. He was born in Cleveland. He was educated at Ohio State and Cornell universities. He was designer and inventor of an electric furnace for the production of aluminum and aluminum alloys and with his brothers organized the Cowles Electric Smelting & Aluminum Co. Its electric smelting plant at Lockport, N. Y., was completed in 1885.

* * *

Harry E. Kies, formerly general superintendent of the Erie Malleable Products Co., Erie, Pa., and previously connected in a similar capacity with the Jamestown Malleable Iron Co., Jamestown, N. Y., died recently in Buffalo, following a brief illness.

* * *

W. Charles Lipe, president of the Globe Forge & Foundries Inc., Syracuse, N. Y., died Aug. 16.

* * *

George W. Thomas, 50, for many years district manager in Chicago for the Norton Co., Worcester, Mass., died Aug. 21 in Chicago. Mr. Thomas had served with the company in Connecticut and Philadelphia before being transferred to Chicago.

* * *

Franklin R. Henry, 62, president of the Majestic Stove Co., St. Louis, died at his home in that city Aug. 21. He was an officer of street railroad companies prior to resigning in 1909 to become vice president and general manager of the stove company. He also was a director of the Mississippi Valley Trust Co. and prominent in St. Louis civic and business enterprises.

* * *

Walter R. Woodford, 72, president of the Rail & River Coal Co., Cleveland, died Aug. 25 at his home in Cleveland Heights, O., of injuries received a few days previously when he fell into a sidewalk elevator shaft. Since he was 19 years old, Mr. Woodford has been associated with the coal industry and railroads. From 1901 to 1909 he was an officer of the Pittsburgh Coal Co. and then was chosen head of the Rail & River Coal Co.

* * *

Judson Brenner, pioneer wire and wire nail manufacturer, died Aug. 23 at his home at Polond, O., near Youngstown, after an extended illness. Just prior to his death he had been re-elected treasurer of Mahoning county. He was born in Youngstown June 27, 1862, and was a graduate of Rayen school in 1881. After serving as bookkeeper for several years in local and Pittsburgh works, he in 1894 became traveling salesman for the Superior Barb Wire Co., Dekalb, Ill. That same year he was named general sales manager and secretary and in 1902 he was elected president of the Superior company and of the Union Fence Co. He continued until 1909 when these Ellwood works, as they then were known, were disposed of to the American Steel & Wire Co. of Illinois, predecessor of the American Steel & Wire Co. of New Jersey, part of the original United States Steel Corp. Mr. Brenner then returned to Youngstown and continued to reside there until the time of his death.

Continental Competition Keener

Iron and Steel Markets in Britain, France and Belgium Quieter—German Blast Furnaces Set New Record for July Output

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Aug. 27.—(*By Radio*)—Business in the British iron and steel markets is quiet, as usual at this season of the year. Middlesbrough blast furnace interests are booking orders for fourth quarter. Demand for east coast hematite is dull. Scotch exports are low. Trade in the Midland district is small, but steady.

Competition from continental steelmakers is keener. The market for tin plate has improved, Australia and South Africa placing orders. A report from Berlin states production of pig iron in Germany in July was 1,203,510 tons, a record for the month. Export trade is quieter. Steel bridge orders have been received from Indo-China and Persia. Conditions in the French iron and steel markets also are reported quiet. Mills accept structural steel contracts for next year at firm prices. Business in Belgium is lagging. Concessions are being made on shipments of basic iron.

British Steel Markets Make Continued Gains

BIRMINGHAM, Eng., Aug. 16.—(*European Staff Service*)—Gradual expansion in pig iron production, a feature of trade since January, was carried further in July by the addition of two more furnaces and an output of 671,900 tons as compared with 657,800 in June. The extent of this expansion may be gaged from the fact that in January the figure was 563,900 tons. The July figure included 208,600 tons of hematite, 283,800 tons of basic, 132,000 tons of foundry and 21,000 tons of forge. Output of steel ingots and castings totaled 80,800 tons as against 830,900 tons in June, showing a slight relapse. The highest point in steel was reached in March with 859,900 tons. This drop in steel may be attributed mainly to dull conditions prevailing in South Wales where tin plate and galvanizing works have been depressed for some time. Fortunately the turn of the tide seems to have been reached in the tin plate trade, as reports from South Wales this week indicate a revival of business, though it is still only on account of exports, the home trade being as dull as ever. Export inquiries this week have been from South America, Australia and the Continent.

Sterling $4.85

Overseas returns show recovery from the low point reached in June, exports of iron and steel taking a sharp turn upwards. These statistical facts have led to some optimistic utterances, one of which comes from Sir Arthur Dorman, creator of the huge combine on the northeast coast, who celebrated his 85th birthday with an important statement on trade prospects. He referred to the fact that negotiations had been going on for some time whereby the heavy industries may unite on the same lines as in America and Germany. He prophesied that in the near future the iron and steel industry would be organized in groups, the northeastern group, the South Wales group and the Midlands and Scottish group. In an exclusive birthday interview with the *North Eastern Daily Gazette* he said: "I am convinced that if Britain stands alone and reorganizes her abundant natural resources she will

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, August 26	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$17.58	3 12 6*	$17.46	3 12 0	$17.46	3 12 0	$17.46	3 12 0
Basic	16.61	3 8 6	17.22	3 11 0	17.22	3 11 0	16.73	3 9 0
Basic-bessemer	18.43	3 16 0†	17.22	3 11 0	17.22	3 11 0	16.73	3 9 0
Hematite, Phosphorus 0.02-0.05	18.31	3 15 6	24.70	630*	.....	.....	17.70	3 13 0
SEMIFINISHED STEEL								
Billets	$31.53	6 10 0	$23.52	4 17 0	$23.52	4 17 0	$24.25	5 0 0
Wire rods	41.83	8 12 6	30.92	6 7 6	30.92	6 7 6	30.31	6 5 0
FINISHED STEEL								
Standard rails	$40.01	8 5 0	$31.53	6 10 0	$31.53	6 10 0	$31.53	6 10 0
Merchant bars	1.79c	8 5 0	1.25c	5 13 6	1.25c	5 13 6	1.26c	5 14 6
Structural shapes	1.60c	7 7 6	1.13c	5 3 0	1.13c	5 3 0	1.14c	5 4 0
Plates, ship, bridge and tank	1.76c	8 2 6	1.39c	6 6 0	1.39c	6 6 0	1.40c	6 7 0
Sheets, black, 24 gage	2.17c	10 0 0	2.42c	11 0 0	2.42c	11 0 0	2.33c	10 12 0
Sheets, galvanized, 24 gage, corrugated	2.90c	13 7 6	2.93c	13 6 3	2.93c	13 6 3	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.29c	5 17 0	1.29c	5 17 0	1.29c	5 17 0
Plain wire, base	2.06c	9 10 0	1.65c	7 10 0	1.65c	7 10 0	1.65c	7 10 0
Galvanized wire, base	3.04c	14 0 0	2.12c	9 12 6	2.12c	9 12 6	2.09c	9 10 0
Wire nails, base	2.39c	11 0 0	1.76c	8 0 0	1.76c	8 0 0	1.79c	8 3 0
Tin plate, base box 108 pounds	$ 4.49	0 18 6	.....	.....	.....	.....	$ 8.97	1 17 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$17.58	3 12 6	$18.62	475(2)	$17.24	620	$20.25	85
Basic pig iron	16.61	3 8 6	19.99	510(1)	17.38	625	21.68	91
Furnace coke	4.00	0 16 6	6.27	160	5.84	210	5.12	21.50
Billets	32.13	6 12 6	24.30	620	24.46	880	28.82	121
Standard rails	1.79c	8 5 0	1.46c	810	1.63c	1,250	1.51c	140
Merchant bars	1.79c	8 5 0	1.34c	745	1.40c	1,075	1.52c	141
Shapes	1.76c	8 2 6	1.26c	700	1.23c	945	1.49c	138
Plates, ship, bridge and tank	1.93c	8 17 6‡	1.42c	790	1.48c	1,140	1.71c	158
Sheets, black, 24-gage	2.28c	10 10 0	2.87c	1,595	2.73c	2,100	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.90c	13 7 6	3.68c	2,045	3.58c	2,750	3.78c	350
Plain wire	2.06c	9 10 0	1.94c	1,075	2.15c	1,650	2.48c	230
Bands and Strips	2.17c	10 0 0	1.51c	840	1.53c	1,175	1.77c	164

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 15s 6d ($3.76) f. o. b. Ferromanganese £21 13s, 0d ($105.00) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($72.75) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

be able to withstand all foreign challenges."

The Middlesbrough district has entered upon what is probably the quietest season of the year as the local holidays are about to commence and the weekly meeting on the iron Exchange does not take place. Naturally business is easing but there are indications of greater activity next month when it is hoped further to increase the furnaces in blast, now that coke is in better supply. Consumers are inquiring for prompt deliveries of iron which is mainly in the hands of merchants, but furnaces which have sold their output to the end of the year are receiving inquiries for next year's supply. The small shipment of iron to foreign destinations is attributed to the scarcity of material available for that market. Prices remain firm. The whole of the output of east coast hematite is being taken up by demand, but manufacturers are keenly desirous of obtaining a better price. Unfortunately they are meeting with a good deal of opposition from consumers, who immediately withdraw their offers of business when a premium is put upon the prices.

Middlesbrough steelworks could handle more work to replace contracts nearing completion but the outlook is regarded hopefully as shipbuilders lately have received some useful contracts. Semifinished steelworks are busy and hold their own against Continental competition.

In the Birmingham district buying is quiet in most departments as industry has not yet got into its stride. August is a slack month and no important developments are anticipated before September. Furnaces producing foundry pig iron are not anxious for orders as they have sold their output for some months and are getting good specifications against contracts. At the same time Northampton and Derbyshire sellers have found some orders and inquiries since the holiday and have no difficulty in obtaining the new prices which are now firmly established. The iron makers as a rule arrange their coke supplies well in advance and this year, at any rate, they have saved money by so doing. As much of the coke from Yorkshire is needed in the North and there is difficulty in obtaining supplies in the Midlands and one Northampton maker of iron suggested that it would probably be impossible to obtain coke for delivery this year. In any case about 16s 6d ($3.99) a ton at the ovens would be needed.

Midland structural engineers have found orders more numerous but still on a light scale so that the volume of steel needed from rolling mills is not expanding to any appreciable extent.

Birmingham merchants have not found any change in the Continental situation in the past week. Buying is quiet although the low prices have naturally brought out fresh inquiry much of which, however, does not materialize. Opinions vary to a great extent regarding possibility of a firmer market for foreign material in the autumn. Some merchants who handle a good deal of these products say the tendency is still downward, whereas others just as strongly contend that prices are firmer. They are sufficiently low to strike alarm among local steelmakers and rerollers, who are more inclined to shade prices for mild steel and billets. With bars selling at £6 15s ($32.73) delivered, from the Continent, the reroller would take a good specification at £8 ($38.80) a ton, which is about 5s ($1.21) below the level at which he has been trading.

While the galvanized sheet trade is still looking for revival it is encouraged by the reopening of the Briton Ferry works of the Whitford Steel Sheet Galvanizing Co., a firm employing 500 men, which has been idle for about three months. The quiet in South Wales has reduced consumption of heavy steel scrap and this market is easier than it has been for a long time. The buyers' idea of prices is now about £3 15s ($18.18), although merchants are holding out for £3 16s ($18.42) and £3 17s 6d ($18.78.)

Belgian Steel Market Believed Past Lowest Point of Decline

BRUSSELS, Aug. 16.—(*European Staff Service*)—The trend of the Belgian iron and steel market has improved, and in the several departments prices are more stable and there is an upward tendency, this being the case for merchant bars. However, it appears that this improvement is the result of heavy purchases by German exporters, who have lately booked important orders and are even expecting a further decrease in quotations. The change in policy tends to show that the lower level has been reached.

The attendance at the Aug. 14 meeting of the Brussels iron and steel exchange was small and transactions were not numerous. Every market is suffering from the effect of the holiday period, and during last and the present week there have only been occasional inquiries and orders.

Many industrialists again are complaining of the high prices fixed by the colleries' combine, and while the prices of steel products are on the decline, coal prices are increasing. The concerns which have no interest in coal mines are in a difficult position, this being particularly the case in regard to transformers.

Semifinished products are not so firm and are quoted at the following prices: 6-inch billets, £4 14s ($22.76); 3 to 4-inch billets, £4 17s ($23.48); 2-inch billets, £5 to £5 1s ($24.25 to $24.49). Sheet bars are sold at £4 19s ($23.96). Normal-profile beams are sold at £5 3s ($24.97), and British sections at £5 6s ($25.69). Bars are steady, and Luxemburg works, which usually push down prices, are not buying. The current quotation is £5 13s ($27.37). There is a hope of seeing higher prices during the last days of August, as delays of delivery are becoming rather extended. There are rumors concerning an increase of transportation rates.

Labor Shortage Hampers French Steelmakers in Meeting Delivery

Franc—3.91c

PARIS, Aug. 16.—(*European Staff Service*)—The French iron and steel market is quiet, and export business is dull. Most works, however, are not in a hurry to get orders, as they have important commitments, and in many cases the difficulty in finding skilled or unskilled labor remains a serious drawback. It has been said that the French government has tried to secure unemployed British workers, but that its inquiry was unsuccessful, as the British minister's answer was that it would be absolutely impossible to obtain the agreement of workers to such a proposition. A crisis has been feared, and it is felt that the present difficulties are not serious, as prices in the home and export markets are higher than those quoted a year ago.

The situation of the collieries is satisfactory. Orders are numerous, and mines are not in a position to give satisfaction to buyers' inquiries. The Franco-Belgian-Luxemburg combine for phosphorus pig iron has maintained its former export prices. Sales on the home market are normal, and works have no difficulty in selling their quotas. No change is to be reported in the position of semifinished products, as prices fixed in July by the A-products union will be maintained until October. The situation of merchant bars is satisfactory. Times of delivery still average two or three months, and some works cannot deliver under four or five months. Normal prices remain on about the same level as during previous weeks, but slight rebates have been obtained by wholesale merchants on large orders and on orders for rods reinforcing concrete bars, a basis price of 720 francs f.o.t., Thionville, having been accepted on the latter.

A difficulty has arisen at the last hour in the constitution of the French comptoir for sheets, and further negotiations have been postponed until September. New railroad rates have been granted by French railroad companies to metallurgical products exported, the reduction being about 20 per cent.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

FRANKLIN DIE CASTING CORP., Syracuse, N. Y., L. J. Purdy, president, a subsidiary of the H. H. Franklin Mfg. Co., also of Syracuse, has bought the equipment and business of the General Die Casting Co., Reading, Pa. The latter company manufactures automobile body hardware. It is planned eventually to move the latter company's plant to Syracuse.

* * *

INDUSTRIAL MACHINE WORKS, Wichita, Kans., has opened a plant at 527 South St. Francis street for repair of oil field tools and boilers. H. L. Oswalt is manager.

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TRUSSED CONCRETE STEEL CO. OF CANADA LTD., has changed its name to Truscon Steel Co. of Canada Ltd., as a matter of simplification.

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CHICAGO & EASTERN ILLINOIS RAILROAD will remove its shops and yards in Evansville, Ind., from the present location south of Pigeon creek to the north side of the creek.

* * *

JOHN GOODING THRESHING CO., Sarnia, Ont., manufacturer of threshing implements, has reduced its pay roll by one-third, owing to falling off of orders in western Canada.

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BLACK SERVANT MFG. CO., St. Louis, has purchased a plant at 2951 North Market street for manufacture of underfeed coal stokers. William F. Brinkman is president.

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SUNNEN PRODUCTS CO., St. Louis, manufacturer of automotive specialties, has acquired a site of 3½ acres at Barthold and Manchester avenues for a new plant.

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ALL STEEL PRODUCTS MFG. CO., H. W. Cardwell president, Wichita, Kans., plans erection of new plant for manufacture of tractor parts and accessories.

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DONNER ENGINEERING CO., Tulsa, Okla., has been organized to manufacture industrial gas burners at 214 South Lansing street. C. A. Wendt is president and A. W. Rush, secretary-treasurer.

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JOHNSON-CARLSON TANK CO., Chicago, manufacturer of wood tanks and pickling supplies, has appointed Weaver Bros. Co., Adrian, Mich., exclusive sales representative in the metal pickling field.

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SCOTT VINER CO., Columbus, O., manufacturer of devices for shelling and preparing green peas for canning, has moved to a larger plant on Markinson avenue, to obtain space for expansion.

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STANDARD STEEL CONSTRUCTION CO. has begun erection of a three-story office building at its Port Robinson, Ont., plant. It will provide quarters for a new drafting department.

* * *

THOMPSON MACHINERY CO., New Orleans, distributor of industrial machinery and equipment, has leased a four-story building on the waterfront for offices and warehouse. B. C. Thompson is president.

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WAYNE MACHINE CORP., Indianapolis, has been organized with 1000 no par value shares by Edward B. Knickerbocker, John D. Clark and C. K. McCormack, to manufacture and act as agents for machinery and machine tools.

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GENERAL BRONZE CORP., Long Island City, N. Y., has purchased the business of the Guaranty Iron & Steel Co., 3847 West Lake street, Chicago, and acquired title to the one-story plant of the Guaranty company, which has a frontage of 240 feet.

* * *

HARNISCHFEGER CORP., 3811 National avenue, Milwaukee, has placed the general contract with Walter W. Oeflein Inc., 110 East Wisconsin avenue, for a 2-story addition to its administration building, 50 x 55 feet, fireproof.

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MISSISSIPPI RIVER FUEL CORP., now building a gas pipeline from Monroe, La., to St. Louis, has let a contract to Hercules Motor Co., Canton, O., for 18 heavy duty pumping units for pump stations along the route.

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RUSH CONSTRUCTION & MFG. CO., Tulsa, Okla., has moved to a new plant recently completed at 212 South Lansing street. A. W. Rush is general manager. Manufacture of ornamental iron will be an added product.

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CONTINENTAL MOTORS CORP., Ross W. Judson, president, Detroit, has formed Continental Aircraft Engine Co., with a Delaware charter, to manufacture an aviation motor developed by the former. Facilities of the parent company will be used in production.

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AIR INDUSTRIES FOUNDRY, recently organized at Wichita, Kans., has moved to a new building at 701 East Ninth street. Special castings for aircraft construction are featured. Lloyd Stearman is president and S. S. Pierce, general manager.

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FEDERAL ELECTRIC CO., Chicago, has bought the Loper Fire Alarm Co., Stonington, Conn., from A. P. Loper, sole owner, who will remain as consulting engineer. The business will be removed to Chicago. The company also bought from Mr. Loper the patent on a wireless fire alarm system.

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TREADWELL ENGINEERING CO., Easton, Pa., is putting on the market a new machine for straightening tubes, rods and miscellaneous shapes. The machine was designed by Peter B. Abramsen, who has joined the Treadwell Engineering Co. organization.

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WISCONSIN ORNAMENTAL IRON & BRONZE CO., 1665 Booth street, Milwaukee, recently merged with the General Bronze Co., Long Island City, N. Y., will start shortly on construction of additions to the Milwaukee plant which will practically double its output. It will be operated as the Wisconsin division of the General Bronze Co., and E. A. Ernest, president, will continue in

charge. In the future, the division will limit its production to bronze products, sold mainly to the construction industry. The plant was established in 1894.

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MURRAY RADIATOR CO. OF CANADA LTD. has opened a plant, 510 King street east, Toronto, for for production of a new type of radiator, of copper, heating by convection rather than radiation. William Catherwood Jr., Brooklyn, N. Y., an officer of the Murray Radiation Corp., is in charge of the Canadian plant.

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FEDERAL STEEL SASH CO., Waukesha, Wis., has established a new sales office in Milwaukee, at 501-502 Stumpf building, 389 East Water street, to handle distribution of its metal building supplies in Wisconsin, Upper Michigan, Minnesota, Iowa and North and South Dakota. J. R. Loehr has been appointed manager.

* * *

INLAND STEEL CO., Chicago, is operating its Milwaukee mill at the highest peak ever reached, and is employing three 8-hour shifts in an effort to meet demand. According to executives, enough business is already on the books to guarantee a further continuance of the present heavy working schedule to the end of the year.

* * *

MANITOBA BRIDGE & IRON WORKS of Winnipeg, Man., has been awarded a contract by the Sherritt-Gordon mines in the Flin Flon area of Northern Manitoba, for the headframe, orebins, work house, change house and main workshops. The contract was placed by Chas. D. Kaeding, consulting engineer for the mining company.

* * *

SMITH ENGINEERING WORKS, 78 Capitol drive, Milwaukee, will build a one-story addition, 90 x 150 feet, to enlarge the manufacturing department of the rock crusher division. Upon its completion, the Smith company will introduce a new portable type of rock crusher. Charles F. Smith is president and general manager.

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TANK AERO CORP., 271 First avenue, Milwaukee, is preparing to place in commercial production a new design of air-cooled V-type, 8-cylinder aircraft engine developing 125 horsepower, on which tests recently have been completed. The concern now manufactures a water cooled aircraft engine at the rate of 42 units monthly and is planning a 2-story addition, 100 x 150 feet, or leasing of factory space of similar proportions. A short time ago the Tank company acquired the Milwaukee Parts Co., maker of automotive and aircraft specialties. A. J. Tank is vice president, general manager and chief engineer.

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YOUNG RADIATOR CO., Racine, Wis., manufacturer of industrial radiators for diesel and internal combustion engines for power units and contracting equipment, is arranging for additional facilities to allow expansion. Most departments the past two months have operated at 12 hours per day, the tool shop day and night. The pay roll is the highest the company ever has had.

* * *

INDUSTRIAL STEEL CASTINGS CO., Toledo, O. has started production in its new plant. The new building has 45,000 square feet of floor space and with older portions makes available a total of 75,000 square feet. A sand testing laboratory and sand reclaiming department have been added. J. L. Tillman is president, J. L. Tillman Jr. and W. E. Wine vice president, R. F. Tillman secretary and L. J. Tillman treasurer.

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STANDARD RADIO MFG. CORP. LTD., Toronto, has taken steps to acquire the radio distributing business of the Canadian Q.R.S. Co. B. A. Trestrail, formerly vice president of that company was elected vice president in charge of the newly organized sales department. A special meeting of shareholders approved of the reorganizing of the financial structure and change of its name from the Standard Radio Mfg. Corp. Ltd. to Rogers Majestic Corp. Ltd.

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DOMESTIC ELECTRIC CO., Cleveland, Carl A. Duffner, president, has bought a site of eight acres and group of buildings at Kent, O., which will be devoted to the manufacture of fractional horsepower motors. The plant includes office space and factory buildings and will afford double the space now occupied at Cleveland. The plant at the latter city will be removed to Kent. The buildings are of three stories and afford 140,000 square feet of floor space. The company is a division of Black & Decker, Towson, Md. Its product is small motors to be built into household appliances, tools and commercial electric appliances.

* * *

MILWAUKEE AIR POWER PUMP CO., 8-10 Keefe avenue, Milwaukee, manufacturing water systems for rural and suburban homes and oil burners for domestic and industrial heating, has been acquired from John R. Ball, president and treasurer, by Julius P. Heil. Mr. Heil is president and treasurer of the Heil Co., Milwaukee, manufacturing motor truck tank and body equipment, hydraulic hoists, oil tanks, etc., but the pump and oil burner business will be continued under its present name as a separate entity. Mr. Heil succeeds Mr. Ball as president, and his son, Joseph F. Heil, becomes treasurer. Homer S. Rogers continues as vice president, and F. W. Richert as secretary. Additional space in the present shop building will be equipped immediately for a substantial increase in output and national distribution will be built up for both the oil burner and water system lines.

* * *

PORT OF NEW YORK AUTHORITY has completed a new research and testing laboratory at Jersey City, N. J., and installing equipment will start at once. The laboratory is needed, according to John F. Galvin, chairman of the port authority, for extensive testing and research work in connection with projects handled by the port authority, particularly construction of the Hudson River bridge and the Kill van Kull bridge. Tests will be made of everything that goes into the structure from gravel to steel girders and wire cables. The laboratory equipment will be of the most modern design and it is said will be second only to that of the bureau of standards laboratory in Washington. Work of installing a special 1,000,000-pound testing machine will be started next week. The Hudson River bridge will be the longest suspension bridge in the world, and the Kill van Kull bridge will have the world's longest arch span.

Bar Iron Wages Steady

Wages in September and October in bar mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers will be based on an average sales price of 2.00c in July and August. The rate is unchanged from the preceding months this year. Puddlers will continue to receive $11.80 a ton. Following are price averages:

	1929	1928	1927	1926
Jan.-Feb.	2.00c	1.85c	1.95c	2.00c
March-April	2.00c	1.85c	1.95c	2.00c
May-June	2.00c	1.90c	1.95c	2.00c
July-Aug.	2.00c	1.90c	1.95c	2.00c
Sept.-Oct.	2.00c	1.95c	1.90c	2.00c
Nov.-Dec.		2.00c	1.85c	2.00c
Yearly average		1.908c	1.925c	2.00c

L. A. Young Spring & Wire Corp., Detroit, has increased its shares from 330,000 to 1,000,000 shares of no par value.

Machinery

Approach of Machine Tool Show Defers Current Buying—In General, Market Retains Firm Tone—Deliveries Still Extended

AN APPRECIABLE recession in machine tool buying is noted in some districts. This may be attributed to two causes; first, the appearance of the summer lull which is customary at this time of the year; and second, the tendency of buyers to hold back until they have inspected new models which will be shown at the machine tool exposition in Cleveland at the end of September. Automotive inquiry still is light, but export business continues strong. The program for the Farmall tractor works of the International Harvester Co., at Rock Island, Ill., is furnishing a good amount of fresh business to Chicago dealers. Estimates of total outstanding orders in this district are from $200,000 to $250,000. Deliveries show little betterment. Prices are unchanged.

New York, Aug. 27.—While in spots demand for machine tools shows some decline, orders remain high for this period. Buying is well spread and includes both heavier and light tools. The delivery situation shows little improvement, six to eight weeks being the rule on standard tools. Export trade is holding up well, especially for grinding machinery. Electrical interests, General Electric Co. especially, are taking a fair volume of equipment.

Worcester, Mass., Aug. 27.—While the general trend of the market remains upward, slight recessions have been noted in the demand for grinding machines. Both internal and external types have fallen off slightly in the past week although production remains higher than last year, the usual summer slump having failed to materalize. This drop is ascribed to a lessening demand from the automobile trade and a tendency on the part of buyers to defer purchases until they have seen the new models at the coming machine tool builders' show in Cleveland. Lathes are moving satisfactorily. Chains and sprocket wheels are being produced on spring schedules.

Chicago, Aug. 27.—Sales of machine tools are exceeding forecasts early in the month. Both sales and inquiries for August approximate last month. If shipments during the remainder of the month move according to schedule, August billings will be the heaviest this year, even surpassing those of May, the previous record month in shipments this year. The continued single item purchases constitute a strong market feature, and inquiry largely is from scattered sources. Much business is being placed by plants doing work for radio receiver manufacturers and for the Western Electric Co., these concerns being purchasers of numerous presses. Most houses are sharing in the program of standard tools being bought for the Farmall tractor works, at Rock Island, Ill., by the International Harvester Co. This program has furnished much fresh business to local dealers in the past two weeks. Important orders are outstanding, some estimates of the total being $200,000 to $250,000. A. O. Smith Corp, Milwaukee, has closed on a 12-foot 1½-inch plate roll. Rock Island and Santa Fe railroads each have closed on several grinding machines. Tool builders are gaining slowly on deliveries, but several still are far behind. One maker of screw machines is naming minimum delivery dates in December and January, 1930.

Cleveland, Aug. 27.—A sharp reduction in current business is being experienced by some dealers, but not in excess of the usual summer lull. One dealer estimates that sales are off approximately 33 per cent from July which was an exceptionally good month for this interest. The proximity of the machine tool builders' show has a deterrent effect on the market, many buyers preferring to suspend purchases until they have had a change to inspect new developments which will be displayed at the show. This situation results in about one month of slack buying. It is reported that a sizable list of tools has been placed with two Cleveland builders by the Fort Pitt Bridge Works, Pittsburgh, for a plant addition.

Ontario Plans Bounty on Iron Ore

Toronto, Ont., Aug. 27.—The Ontario government will give a bonus of 1 cent per unit on all iron ores mined in the province. Announcement to this effect was made by Premier Ferguson, at a meeting in Sault Ste. Marie, Ont., to promote development of the iron and steel industry. An address was delivered by Robert Turnbull, who detailed his investigations into the possibility of treating low grade ores by an electric process, converting them into sponge iron, enabling them to compete with the pig iron brought in from the United States. The experiments he said had been most satisfactory and the investigation would be carried on on a more extensive scale. The premier said that legislation to bring the proposed bonus into effect would be introduced at the next session of the legislature. Steel experts estimate that on the basis of the iron content of the ore available in Northern Ontario, this bonus will work out at about 75 cents a ton.

July Hoist Sales Lower

New York, August 27.—Electric Hoist Manufacturers' association members report orders during July declined 16 per cent compared with June. The value of such orders decreased 11.909 per cent compared with the previous month.

Shipments were heavier in July by 7.468 per cent.

Steel Price Index Down

Washington, Aug. 27.—Iron and steel wholesale price index in July was 97.9, compared with 98.2 for June and 94 for July of last year, taking 1926 at 100, according to the bureau of labor statistics, department of labor.

Structural steel July wholesale price index number was 99.6 compared with 99.6 for June and 94.5 for July of last year, while July number for nonferrous metals was 105.1, compared with 104.8 for June and 92.6 for July of last year.

For "metals and metal products" the July wholesale number was 105, compared with 105.1 for June and 98.6 for July of last year, while for "other metal products" the July number was 98.5, compared with 98.5 for June and 96.9 for July of last year. For agricultural implements the July number was 98.3, compared with 98.3 for June and 98.8 for July of last year.

Diesel Ship Launched

Toronto, Ont., Aug. 27.—The first diesel engined ship to be built in Canada was launched at the yards of the Davie Shipbuilding & Repairing Co. at Quebec, on Aug. 22. She was given the name of GRAINMOTOR and was built for the Canada Steamship Lines, to operate in the grain carrying trade between Port Colbourne and Winnipeg. Her dimensions are length 252 feet, beam 43 feet, depth 20 feet 6 inches, and has a capacity of 100,000 bushels. She is engined with bessemer diesel engines, with a direct drive and will develop 800 horsepower from her main engines. There are three diesel auxiliary engines capable of developing 75 horsepower to develop electric power to lubricate pumps, winches, windlass and steering gear. A donkey boiler will provide steam for heating. The engine takes up a small space, allowing the maximum capacity of bulk cargo.

Sheet Sales Increased in July; Output Lower

Sheet sales by independent mills increased from a daily average of 10,264 tons in June to 10,878 tons in July. Production decreased from 11,261 tons to 10,448 tons, and shipments were reduced from 11,650 tons to 11,118 tons. July sales totaled 337,222 tons, production 323,905 tons and shipments 344,676 tons. The National Association of Flat Rolled Steel Manufacturers' complete report for July follows:

	Net tons	Per cent of capacity
Total sales for month	337,222	102.2
Total production	323,905	98.1
Total shipments	344,676	104.4
Unfilled tonnage as of Aug. 1.	658,155	199.4
Approximate finished stock on hand awaiting shipments	107,751	32.6
Approximate in stock, unsold	47,103	14.3

Total number of hot mills in the United States is 723 having a capacity for July, 1929 of approximately 486,430 net tons, and the percentage of the capacity to which the figures shown are related is 67.9.

A monthly comparison of sales, production and shipments follows:

	Sales	Production	Shipments
January, 1928	302,921	316,541	274,126
February	266,210	330,565	298,420
March	399,441	366,127	359,532
April	284,070	327,909	327,674
May	250,316	349,367	326,324
June	318,902	311,629	308,741
July	333,357	267,685	278,310
August	254,397	329,396	324,691
September	370,936	318,907	322,876
October	344,614	369,243	354,925
November	346,041	358,402	307,790
December	323,421	302,182	296,687
January, 1929	438,390	391,404	362,229
February	389,496	326,468	325,848
March	464,297	364,202	363,648
April	398,206	375,256	377,274
May	279,783	393,430	392,336
June	307,911	337,841	347,989
July	337,222	323,905	344,676

Daily averages for the first seven months of 1929 follow:

	Sales	Production	Shipments
January, 1929	14,142	12,626	11,685
February	13,910	11,659	11,637
March	14,977	11,748	11,731
April	13,273	12,508	12,576
May	9,025	12,691	12,656
June	10,264	11,261	11,560
July	10,878	10,448	11,118

Canadian Steel Tariff To Be Revised

When the advisory tariff board reassembles next month at Ottawa, Ont., a report will be presented by the committee appointed to investigate the Canadian iron and steel tariff, which included representatives of the steel companies and fabricators, as well as members of the board. The report, which is at present confidential, involves a general revision and rewriting of the whole iron and steel structure, comprising about 200 items.

While the general tendency is upward there are some reductions, a compromise being necessary to reconcile differences of opinion between those engaged in the basic industry and producers of the finished article. It is understood that structural steel has received particular attention. The report will be discussed at public hearings late in September. The final conclusions of the board will then be submitted to the government, which will decide as to whether it will be presented to parliament. The general opinion is that at the next session something will be done to foster the iron and steel industry, in view of foreign competition.

Soil Corrosion Research Is Continued

Recent removal of a third group of corrosion specimens, buried in 1928, marked another step in the extensive study of the effects of soil corrosion, now being undertaken by the bureau of standards, Washington. Notice of this progress appeared in an article on page 332 of the Aug. 8 issue of IRON TRADE REVIEW. However, it was incorrectly stated that sufficient data were available to justify a comparison of materials. Although the bureau has observed only minor variations in rates of corrosion of different ferrous pipe materials, present data do not seem sufficient to warrant any comparison of pipe materials. Further detailed information on this subject will appear in the forthcoming issue of the *Journal of Research*, a bureau of standards publication.

Ontario Steel Prospers

Ontario Steel Products Ltd. reports a net profit of $80,911, for the year ended June 30, after deductions of operating costs, depreciation, interest, etc. Tonnage and dollar output exceeded all previous records but the percentage of profits was somewhat reduced. Extensions to the Dowsley Spring & Axle Works, Chatham, Ont., will be completed in October.

Kalamazoo Stove Co., Kalamazoo, Mich., reports deliveries in the first half year 17.5 per cent over a year ago. July orders were 30 per cent over last July.

Convention Calendar

Aug. 29-30—Foundry Equipment Manufacturers association. Summer meeting at Hotel Van Curler, Schenectady, N. Y. H. Cole Estep, 1213 West Third street, Cleveland, is secretary.

Sept. 3-6—American Institute of Electrical Engineers. Annual Pacific coast convention at Santa Monica, Calif. F. L. Hutchinson, 33 West Thirty-ninth street, New York, is secretary.

Sept. 6-7—Lake Superior Mining institute. Twenty-seventh annual meeting at the Houghton club, Houghton, Mich. A. J. Yungbluth, Ishpeming, Mich., is secretary.

Sept. 9-10—American Manganese Producers' association. Annual convention. Mayflower hotel, Washington. H. A. Pumpelly, Metropolitan bank building, Washington, secretary.

Sept. 9-12—American Welding society. Annual fall meeting at Hotel Statler, Cleveland. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

Sept. 9-12—American Institute of Mining and Metallurgical Engineers. Meeting of iron and steel division at Hotel Cleveland, Cleveland. H. Foster Bain, 29 West Thirty-ninth street, New York, is secretary.

Sept. 9-12—American Institute of Mining and Metallurgical Engineers. Meeting of institute of metals division at Hotel Cleveland, Cleveland. W. M. Corse, 810 Eighteenth street, Washington, is secretary.

Sept. 9-13—American Society for Steel Treating. Eleventh annual convention and national metal exposition at Public auditorium, Cleveland. Headquarters at Hotel Cleveland. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Sept. 10-13—Iron and Steel institute (Great Britain). Autumn meeting at Newcastle-on-Tyne, England. G. C. Lloyd, 28 Victoria street, London, S.W.1, is secretary.

Sept. 11-13—American Society of Mechanical Engineers. Meeting of iron and steel division at Hollenden hotel, Cleveland. P. T. Wetter, 29 West Thirty-ninth street, New York, is secretary.

Sept. 19-21—American Electrochemical society. Fall meeting at William Penn hotel, Pittsburgh. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Sept. 24-25—American Refractories institute. Annual technical meeting at Columbus, O. Dorothy A. Texter, 2218 Oliver building, Pittsburgh, is secretary.

Sept. 25-27—American Drop Forging institute. Fall meeting at Buckwood Inn, Shawnee-on-Delaware, Pa. Donald McKaig, 1001 Union Bank building, Pittsburgh, is secretary.

Sept. 30—Oct. 2—Concrete Reinforcing Steel institute. Semiannual meeting at Wawasee hotel, Wawasee, Ind. M. A. Beeman, 2112 Tribune tower, Chicago, is secretary.

Sept. 30-Oct. 2—National Industrial Advertisers association. Eighth annual convention in Cincinnati. H. VonP. Thomas, Bussman Mfg. Co., St. Louis, is secretary.

Sept. 30-Oct. 4—National Machine Tool Builders' association. Second national machine tool exposition at Public auditorium, Cleveland. E. F. DuBrul, 1415 Enquirer building Cincinnati, is secretary.

Sept. 30-Oct. 4—National Safety council. Eighteenth annual meeting at Chicago. William H. Cameron, 108 East Ohio street, Chicago, is managing director.

Oct. 2-4—Society of Automotive Engineers. Production meeting at Hotel Cleveland, Cleveland. Coker F. Clarkson, 29 West Thirty-ninth street, New York, is secretary.

Oct. 7-10—American Society of Mechanical Engineers. Third national fuels division meeting in Philadelphia. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

Oct. 21-23—American Society of Mechanical Engineers. Meeting at Portage hotel, Akron, O. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

Oct. 21-24—American Hardware Manufacturers association. Annual meeting at the Marlborough-Blenheim hotel, Atlantic City, N. J. Charles F. Rockwell, 342 Madison avenue, New York, is secretary-treasurer.

Oct. 21-24—National Hardware Association of the United States. Thirty-fifth annual convention at the Marlborough-Blenheim hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary-treasurer.

Oct. 24-26—American Gear Manufacturers association. Semiannual meeting at Benjamin Franklin hotel, Philadelphia. T. W. Owen, 3608 Euclid avenue, Cleveland, is secretary.

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thermocouples, miniature furnaces and potentiometers. In charge of the exhibit will be H. Brewer, A. F. Moranty, E. G. Estabrook, P. H. Taylor, G. W. Tall, A. E. Tarr, J. E. Korp and T. C. Smith

LEITZ, E., INC., New York. Booths 74, 95.—Exhibit will include micrometallograph, standard laboratory and research metallographic equipment, embodying several recent developments; metallurscope, a portable metallographic instrument of simplified construction; grinding and polishing machine with improved specimen holder; line of microscopes of smaller size and numerous accessories of interest to metallurgists. Attending: R. Tvestmann, O. Soetbeer and S. Borell.

LINCOLN ELECTRIC CO., Cleveland. Booth 224.—Exhibiting in operation the new arc welder and latest type of welding accessories and supplies. Samples produced by arc welding; motors; safety push buttons; and across-the-line starters for use with motors up to 30 horsepower also will be shown. In charge of the exhibit will be A. F. Davis, Maurice Taylor, T. P. Tarbell, B. F. Kessler, O. P. Hanchette, R. B. Tuhey and A. T. Smith.

LINDE AIR PRODUCTS CO., New York. Booths 225, 227, 229.—Exhibiting in operation complete line of oxyacetylene welding and cutting apparatus and supplies; complete line of welding generators and flood lights. In attendance at this booth will be H. F. Buckley, T. C. Fetherston, H. H. Griffith, H. H. Dye and De W. Endicott.

LUDLUM STEEL CO., Watervliet, N. Y. Booths 22, 51.—Exhibiting noncorrosive, heat-resisting and hardened steels, tool steel, rustless iron and steel, Strauss metal, tungsten carbide cutting material. Attending will be H. G. Batcheller, F. B. Lounsberry, J. E. Polhemus, A. F. Dohn, C. B. Templeton, H. A. DeFries, J. T. Norton, Ralph DeVries, A. K. Martin, C. W. Lindemuth, W. H. Vrooman, C. B. Boyne, K. G. Reynolds, W. Westover, W. H. White, T. C. Sherman, H. I. Askew, J. C. Gearhardt, H. Hardwicke, P. E. Floyd, G. F. Wilson, G. Peterson, G. D. Sleeth, W. P. Ehrenberg, P. R. Thurston, W. Kinsey, G. D. Howk, J. E. Jones and E. E. Sanborn.

M

MAEHLER, PAUL, CO., Chicago. Booth 206.

MAHR MFG. CO., Minneapolis. Booth 356.—This company will exhibit illustrations of continuous furnaces, car-type furnaces, and batch-type furnaces. Attending: W. G. Barstow, O. E. Ertl, D. H. Ruhnke, A. J. Nordenson, B. G. Harmon, R. G. White, A. E. Stenzel, R. A. Ledebur and A. F. Tenney.

MANHATTEN RUBBER MFG. CO., ABRASIVE WHEEL DEPARTMENT, Passaic, N. J. Booth 361.—Exhibit of this company will include examples of parts ground from rubber-bonded wheels, ranging from the rougher classes of work to finer operations. Attending will be W. H. Steinberg, C. M. Lawton, C. A. Fox, C. E. Forney, R. G. Brinkerhoff and Howard Pyle.

MARBURG BROS. INC., New York. Booth 203.—An operating exhibit of precision die filing and sawing machine will be shown. Theodore H. Marburg, O. P. Brett, Richard Krause and Herbert Zimmerman will be in charge.

McCANN-HARRISON CORP., Cleveland. Booths 273, 289.—This company will exhibit a model of continuous conveyor beam furnace in operation. Attending will be H. P. McCann, Robert L. Corbett, Edward Busch and Charles L. Stuart.

METAL & THERMIT CORP., New York. Booth 236.—Exhibiting heavy thermit welding samples and metal samples. Henry D. Kelley will be in charge.

MICHIANA PRODUCTS CORP.—CHROBALTIC TOOL CO. DIVISION, Michigan City, Ind. Booth 204.—This company will exhibit heat-resisting and acid-resisting castings. In attendance will be W. B. Sullivan, L. H. Whiteside, C. M. Conner, J. F. Sweeney, A. A. Cash, O. G. Voss, T. A. Meyer, Charles Peterson, H. Klouman and E. Whiteside.

MICHIGAN STEEL CASTINGS CO., Detroit. Booths 87, 89, 91.—This company will exhibit alloys in the form of castings, rolled bars, wire and sheets, combination cast base sheet wall carburizing boxes, dipping baskets, dipping racks, furnace racks; full-size section of a steel mill pack heating furnace in operation showing the application of cross-beams, rollers and chain; and roof-type replaceable wearing strip rolling guides; also electric steel castings. Attending: F. J. Stanley, E. D. Flintermann, J. D. Corfield and A. A. Gould.

MIDVALE CO., Philadelphia. Booth 54, 75.—Exhibiting miscellaneous forgings, tool steel products and alloy steel products. Attending: W. B. Sullivan, H. L. Frevert, Howard Myers, J. R. Adams, Francis B. Foley, Henry Ziesing, H. E. Rowe, Walter B. Smyth, Fred W. Sager, Harvey Garrett, Robert M. Bird, Thomas Besom, Herbert Cox, J. H. Glass, L. C. Berkey and Harry Teel.

MILNE, A., & CO., New York. Booth 284.—Exhibit will include tool and die steels, hollow drill steel, solid drill steel, auger drill steel, special iron, cold-drawn electrical iron, anvils, forged tools, file steel, aircraft tubing, cutlery sheets and ball bearing steel. Representing this company: V. A. Greene, H. R. Adams, Henry Sears Hoyt, J. King Hoyt Jr., A. G. Reid, B. Brower and Miss K. E. McDonald.

MILWAUKEE DIE CASTING CO., Milwaukee. Booth 47.—This company will exhibit many sizes and shapes of tin, lead, zinc, and aluminum-base alloy die castings. C. H. Frantz and H. F. Schroeder will represent the company.

MORSE TWIST DRILL & MACHINE CO., New Bedford, Mass. Booth 56.—Exhibiting high-speed and carbon twist drills, reamers, milling cutters, taps and dies. In attendance: W. T. Read, F. O. Lincoln and R. F. Chase.

N

NATIONAL ELECTRIC LIGHT ASSOCIATION, New York. Booths 448, 449, 450, 451, 452.—Exhibiting photographs showing applications of electric furnaces to steel heat treating. Attending will be J. L. Faden, Robert M. Keeney, R. T. Kaighin, James H. Faulkner, Charles E. Russel, O. Wilhelmy, H. J. Hall, C. P. Yoder, R. W. Heller, D. H. Gerhard and W. E. Benninghoff

NEW JERSEY ZINC CO. New York. Booth 414.—This company will exhibit about 40 die castings of small and intricate design; also die castings of larger size chromium-plated and nickel-plated rolled zinc. C. R. Maxon, S. E. Maxon, R. M. Curts, R. Davidson, W. J. Keuhn and W. P. Hardenbergh Jr. will represent the company.

NORTHWESTERN MFG. CO., Milwaukee. Booth 234.—Exhibiting 300-ampere arc welder, nonoperating gasoline engine driven arc welder, and welding parts. K. L. Hanson, F. A. Wilch, and A. H. Friese will represent the company.

NORTON CO., Worcester, Mass. Booths 288, 290.—This company will exhibit in operation high-speed grinding equipment, electric furnaces, abrasive products and heavy refractories. In charge of the exhibit will be Robert Kirkpatrick, H. A. Blackburn, K. H. Bird, A. R. Sandine, R. H. Cannon, A. T. Douglas and H. R. Swanberg.

NUGENT STEEL CASTINGS CO., Chicago. Booths 89, 91.—This company will exhibit electric steel castings.

O

OHIO STEEL FOUNDRY CO., Springfield, O. Booth 278.—Exhibiting a heat-resisting alloy produced in a complete range of nickel-chromium and iron-chromium base. W. J. Gilmore, W. J. Hayes and Jesse F. Monfils will represent the company.

OLSEN, TINIUS, TESTING MACHINE CO., Philadelphia. Booth 48.—This company will exhibit a complete line of testing machines of all types. T. Y. Olsen, N. B. Lewis, Jacob Lundgren and Bruce L. Lewis will be in charge of the exhibit.

P

PAGE STEEL & WIRE CO., New York. Booth 311.—Exhibit will include testing machine in operation showing magnetic method of testing welding wire for both gas and electric welding. In attendance: W. T. Kyle, J. J. Flaherty, C. A. McCune and W. L. Walsh.

PARK CHEMICAL CO., Detroit. Booth 15.—Exhibit will include case hardening compounds, cyaniding compounds, drawing salts, reheating salts, lead pot covering, carbon preventer, lacquer rubbing compounds, masking compounds, and quenching and drawing oils. Joseph N. Bourg, J. C. Thompson and F. W. Faery will be in charge.

PELS, HENRY, & CO., INC., New York. Booths 203, 205, 207.—Exhibit will include billet shear, gate shear, closed throat press, combination punch, plate shear, angle bar and tee cutter and other types. C. L. Martin, T. F. Kane, E. E. Tailfer and J. A. Weigand will be in charge.

PENTON PUBLISHING CO., Cleveland. Booth 308.—Will show technical and commercial books and periodicals dealing with heat treating, forging, welding, metallurgy and other phases of the metalworking industry. Restroom for those desiring to confer in quiet. Copies of IRON TRADE REVIEW, *Daily Metal Trade, The Foundry* and other Penton publications will be available. Represented by C. J. Stark, J. D. Pease, E. L. Shaner, G. O. Hays, John Henry, S. H. Jasper, F. F. Light, E. C. Barringer, E. F. Ross, J. D. Knox, A. H. Allen, H. B. Veith, W. S. Doxsey, H. N. Pickett and F. B. Jacobs.

PERMUTIT CO., New York. Booth 370.

PITTSBURGH INSTRUMENT & MACHINE CO., Pittsburgh. Booth 96.—Operating exhibit of testing machines, brinell testers, impact testing machine, sheet metal tester, metallographic grinder, brinell microscope, depth indicator, proving ring. Showing for first time direct-reading brinell instrument attached to brinell machine, showing diameter of ball impressions on ground glass plate while test load is applied. In attendance: Charles Trueg and Walter Kammerer.

PRESSED STEEL CO., Wilkes-Barre, Pa., Booth 410 A.—Showing carburizing and annealing boxes, welded and seamless formed containers, seamless formed stampings of various grades of chrome and chrome-nickel alloys. J. H. MacVeigh and F. A. Schmidt will be in attendance.

PRODUCTION MACHINE CO., Greenfield, Mass. Booth 306.—An operating exhibit of a heavy duty centerless polishing and finishing machine, centerless polishing and finishing buffing machine and combined disk grinder and polishing machine. Attended by W. S. Howe, A. H. Behnke and T. A. Welsh.

PROSSER, THOMAS, & SON, New York. Booth 401.—In operation, commercial tool grinder, lathe, tungsten-carbide lathe, planer, shaper tools, drills, reamers, milling cutters, boring and special tools. Represented by R. D. Prosser, W. E. Guild, E. R. S. Reeder, J. A. Deakin, J. Hugo Smith, H. B. Spaulding, H. E. Berry and L. N. Hall.

R

RANSOHOFF, N., INC. Booth 392.—Operating exhibit of return tumbling barrel, and enlarged photographs of descaling forgings, cleaning stampings, etc., with samples of work. N. Ransohoff and D. M. Powers will be present.

REEVES PULLEY CO., Columbus, Ind. Booth 316.—Exhibit will include a speed transmission in operation, showing application and variable speeds. Carl M. Reeves and C. L. Irwin will be in attendance.

REINTJES, GEORGE P., CO., Kansas City. Booth 279.—An interlocking tile arch will be shown consisting of two shapes, sufficient for any variation in span for heat treating furnaces. In attendance, George P. Reintjes.

REPUBLIC FLOW METERS CO., Chicago. Booth 275.—Showing new control pyrometer, flow meter, CO_2 meter and gas meters. Attended by K. D. Roudebush, C. H. Tate, T. E. Bell, C. E. Pritchett, R. C. Ascher, E. Schneider.

RIEHLE BROS. TESTING MACHINE CO., Philadelphia. Booth 100.—Exhibit will include hardness tester, calibrating rings, brinell machine, mirror extensometer reading to 1/100,000 of an inch, and similar apparatus. A. Fuller Riehle will be in attendance.

ROCKWELL, STANLEY P., CO., Hartford, Conn. Booth 404.—An operating exhibit, including dilatometer with enclosed panel attached to pit type electric furnace, portable quenching tank agitator. Represented by Stanley P. Rockwell and William A. Stumpf.

ROEBLING'S, JOHN A., SONS CO., Trenton, N. J. Booth 234.—Samples of welding wire on exhibition, in charge of R. R. Newell.

ROESSLER & HASSLACHER CHEMICAL CO., New York. Booths 19, 21.—Showing chemicals for case hardening, heat treatment and heat coloring of steel, electroplating, with demonstrations of various operations. In attendance: Walter M. Gager, Charles H. Proctor, Carl Dittmar and Carl Hamann.

ROTOR AIR TOOL CO., Cleveland. Booth 343.—Showing in operation pneumatic drills, grinders, sanders and buffers. Represented by H. P. Bailey, K. L. Pohlman, W. G. Baily and C. B. Scott.

RUEMELIN MFG. CO., Milwaukee. Booth 326A.—Will exhibit sanitary sandblast complete, exhaust-type fan, midget sandblast gun, operator's sandblast helmet and junior sandblast generator. H. A. Flitz, and T. C. Tipper will be in attendance.

RUSTLESS IRON CORP. OF AMERICA, New York. Booth 93.—Exhibiting articles made from rustless iron, such as automobile parts, semifinished parts; and chrome ore. Dr. M. H. Sommer and A. L. Grinell will attend.

RYAN, SCULLY & CO., Philadelphia. Booth 348.—Exhibiting: New type automatic control valve for multiple control; new type continuous belt; miscellaneous types burner equipment. In attendance: F. J. Ryan, Gordon A. Webb, A. H. Kruger and J. Kniveton.

RYERSON, JOSEPH T., & SON INC., Chicago. Booth 368.—Will show general steel products, cold-rolled, tool and alloy steels and rust and heat-resisting alloys. Attended by H. B. Ressler, Fred Doran, G. VanDyke, A. Y. Sawyer and Charles Kehr.

S

SAFETY EQUIPMENT SERVICE, Cleveland.

Booth 233.—Exhibit will contain safety equipment and devices, goggles, clothing, gloves, sandblast hoods, welding helmets, gas masks, safety signs, safety guards, etc. In attendance: Buell W. Nutt, Harry F. Lea, Andrew Evers, F. C. Blake and E. C. Lyon.

SCHERR, GEORGE, CO. INC., New York. Booth 200.—An operating exhibit including precision measuring machines and instruments, cutting-off machines, thread milling machines, all in operation. George Scherr, Fritz Konig, George Kaner, and George Vandaplank will be in attendance.

SELAS CO., Philadelphia. Booth in Gas Section.—Will show in operation gas mixing machines operating brazing torches, solder irons, etc., and automatically controlled industrial furnace. Fred Hess and E. A. Furkert will be in charge.

SENTRY CO., Taunton, Mass. Booth 391.—Will show an operating exhibit, including furnaces with control and high-speed steel hardening furnaces using diamond block control. Exhibit in charge of F. B. Crocker and A. A. Haryer.

SHAKEPROOF LOCK WASHER CO., Chicago. Booth 357.—Will demonstrate entire line of standard lock washers and locking terminals, showing locking principle. In attendance: Herbert M. Howison and Jack M. Gribbie.

SHAWINIGAN PRODUCTS CORP., New York. Booth 239.—Carbide and carbide packages will be shown by W. P. Chur.

SHORE INSTRUMENT & MFG. CO., Jamaica, N. Y. Booth 17.—Hardness testing instruments of various types will be shown by F. G. Kendall and J. M. Kendall.

SIMONDS SAW & STEEL CO., Fitchburg, Mass. Booth 342.—Exhibit will consist of metal-cutting circular and bands saws, files, hack saw blades, special steels. In attendance: C. R. Pafenbach, George T. Curtis and Harry P. Baumann.

SIVYER STEEL CASTING CO., Milwaukee. Booth 89, 91.—Will exhibit electric steel castings.

SMITH, DAVID H., & SONS INC., Brooklyn. Booth 438.—An operating exhibit including billet shears, angle bending rolls and special machinery. Attended by William H. Kay, Dudley J. Smith and Olaf Olsen.

SNAP-ON WRENCH CO., Chicago. Booth 280.

SOUTHERN MANGANESE STEEL CO., St. Louis. Booth 18.—Showing high temperature and corrosion-resisting products. In charge of F. A. Fahrenwald, A. W. Daniels, Russell J. Williams and D. M. Powers.

SOUTHWARK FOUNDRY & MACHINE CO., Philadelphia. Booth 31.—Showing universal testing machine, 60,000 pounds capacity, making tests; 40,000-pound field testing machine; electric telemeter; strain gage; tensometer. In charge of F. G. Tatnall, H. A. Weaver and H. J. Ruch.

SPENCER TURBINE CO., Hartford, Conn. Booth 291.—Exhibiting turbo-compressors for supplying air for oil and gas-burning industrial furnaces. Attended by S. E. Phillips, F. A. Wright, F. E. Warnke and R. A. Brackett.

SQUARE D CO., Detroit. Booth 332.

STAMETS, WILLIAM K., Cleveland. Booths 205, 205A, 207.

STANDARD ALLOY CO. INC., Cleveland. Booth 33.—Will exhibit lead and cyanide pots; normalizing and pack heating furnace disks and spacers; furnace parts and accessories. Exhibit attended by Harvey M. Smith, Frank F. Jackson, Emerson M. Williams, Charles D. Cutting, H. A. Cutting, W. D. Mann, George S. McFarland and A. D. Darragh.

STANDARD EQUIPMENT CO. INC., New Haven, Conn. Booth 379.—This will be a photographic exhibit showing a scouring machine in operation removing scale from hot-rolled and annealed strip steel, with allied equipment, in charge of Charles A. Dreisbach and Burton L. Hoskins.

STEEL CITY TESTING LABORATORY, Detroit. Booth 102.

STOODY CO., Whittier, Calif. Booth 241.—Will show welding rods, equipment, grinders and electrode holders. Represented by Robert L. Ozias and C. E. Phillips.

STRONG, CARLISLE & HAMMOND CO., Cleveland. Booth 209.—Will show in operation a duralumin treating furnace; automatic temperature control; photographs and photostats showing details of larger furnaces. In attendance: G. S. Peterson, Jacob Weintz and A. B. Lindsay.

STUART, D. A., & CO., Chicago. Booth 78.—Showing various parts machined with new type metalworking oils; samples of various oils. Attended by C. H. Baker, G. A. Dudley, W. M. Duncan, W. H. Huelster, T. B. Langdon and W. H. Oldacre.

SULLIVAN MACHINERY CO., Chicago. Booth in Gas Section.

SURFACE COMBUSTION CO., Toledo. This company will exhibit standard heat treating furnace equipment with full automatic temperature control; and burner equipment. In attendance will be F. H. Adams, C. B. Phillips, C. H. Blesch, A. L. Hollinger, W. O. Owen, Eugene A. Weaver, F. H. Trembly, S. R. Anderson, J. M. Brown and O. R. Olsen.

T

TAYLOR-WINFIELD CORP., Warren, O. Booth 244.—Exhibiting in operation both spot and butt welding equipment and a portable type of spot welding machine. F. C. Terry will be in charge.

THOMPSON GRINDER CO., Springfield, O. Booth 378.—Will show in operation a fatigue testing machine running tests on various metals and alloys. In charge of W. G. Baldenhofer and R. R. Baldenhofer.

TIMKEN STEEL & TUBE CO., Canton, O. Booths 24, 36.—Will show moving exhibit showing wide use of steel and services available through the company. In attendance: M. T. Lothrop, A. J. Sanford, W. G. Hildorf, R. L. Wilson, Robert Atkinson and Walter Wiewel.

TOLEDO SCALE CO., Toledo. Booth 328.

TOMKINS-JOHNSON CO., Jackson, Mich. Booth 369.—Exhibiting die sinking milling cutters and air-operated chucks and cylinders. In attendance will be R. B. McDonald, A. R. Johnson and H. A. Tomkins.

TORCHWELD EQUIPMENT CO., Chicago. Both 264.—Showing in operation hand welding torches, machine welding torches, hand and machine cutting and welding torches, decarburizing and lead burning equipment, acetylene generators, accessories and supplies. Attended by W. A. Slack, R. M. Smith, H. G. Larisch, C. E. Davis and W. E. Lyons.

TRENT, HAROLD E., CO., Philadelphia. Booth 341.—Will show electric furnaces and temperature control. H. E. Trent will be in charge.

U

UNA WELDING & BONDING CO., Cleveland. Booth 261.—Exhibiting welders, automatic welding head, welding rods for ferrous and nonferrous welding. Attended by E. R. Alexander, E. W. Kronbach, A. A. Probeck, H. P. Blum, W. J. Bushea, L. S. Burgett and J. P. Austin.

UNITED ENGINEERING SOCIETY (Endowment Committee), New York. Booth 435.—This organization will exhibit large photographs and diagrams.

V

VANADIUM ALLOYS STEEL CO., Latrobe, Pa. Booths 10, 12, 39, 41.—Exhibit will include high-speed steel, die steel, cold-heading steel, with fractures and tools of various steels. Represented by R. C. McKenna, Floyd Rose, L. D. Bowman, J. P. Gill, R. B. George, W. R. Mau, W. D. Fisher, T. J. Van de Motter and C. V. Reilly.

VANADIUM CORP. OF AMERICA., New York. Booths 20, 49.—Exhibiting steelmaking alloys, ores, oxides, chemical compounds of rare and semirare metals; steel forgings and castings showing applications to various industries. Attended by J. A. Miller, H. T. Chandler, N. Petinot, C. N. Dawe, C. B. Woodworth, T. N. Bourke, B. D. Saklatwalla, Jerome Strauss, G. L. Norris and A. W. Demmler.

VAN DORN ELECTRIC TOOL CO., Cleveland. Booth 35.—Exhibit includes portable electric drills, grinders, reamers, etc., in charge of F. Schneider, F. H. Zulauf, R. W. Procter, E. W. Waechter, S. S. Waters, L. L. Charnicky, F. R. DuGuay and F. H. Schell.

VICTOR-PENINSULAR DIVISION, Detroit. Booth 274.

VICTOR X-RAY CORP., Chicago. Booth 322.—Presents an exhibition of X-ray negatives showing imperfections in materials, illustrating value of this means of determining necessary changes in processes, in charge of E. W. Page.

W

WATER TREATMENT CO. OF AMERICA, Pittsburgh. Booth 227.—Reception room with literature. In attendance: Harry L. Baer and George Neilson.

WEIDEMANN MACHINE CO., Philadelphia. Booth 6.—Will exhibit spring winder, steel vise, turret punch. In attendance: O. F. Weidemann and G. A. Hancock.

WELDIT ACETYLENE CO., Detroit. Booth 242.—Oxyacetylene welding and cutting equipment will be shown in operation by O. L. Smith, J. B. Manor and J. Bronson.

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa. Booth 305.—Will show in operation an automatic welding outfit, including new type head, the control and the operator's panel; other welding machines and samples of welding. Attended by W. W. Reddie, R. L. Cronemeyer, G. H. Koch, F. M. Bernard, W. G. Pearson, C. W. Babcock and P. H. Grunnagle.

WHEELING MOLD & FOUNDRY CO., Wheeling, W. Va. Booth 400.—Exhibiting in operation a model steam hammer showing application of steel and alloy steel castings, dies and die blocks, test specimens, sections of alloy rolls and castings. In attendance: H. E. Field, E. A. Balsley, R. C. Heaslett, D. Wyman and George Chandler.

WHEELOCK, LOVEJOY & CO. INC., Cambridge, Mass. Booths 84, 86, 88.—Motion pictures of various activities in warehouses. Attended by A. Oram Fulton, Frederick H. Lovejoy, George S. Longley Jr., Edward C. Bartlett, Stanley W. Parker, C. Robert Jenks, Murray N. Allison, George A. Baron, Henry A. Bischoff, A. Reed Townsend and Floyd J. DeVan.

WHITMAN & BARNES INC., Detroit. Booth 83.—Exhibit consists of drills, reamers, milling cutters and end mills. Attended by Fred J. Smith and E. T. Oliver.

WICKWIRE SPENCER STEEL CO., New York. Booths 238, 240.—Operating exhibit will show spiral conveyor belt traveling through electric furnace at 1800 to 2000 degrees Fahr. Also shown, samples of coil springs, formed and welding wire. In charge of F. W. Hale, Dwight Granger, Jay R. Worsfold, E. C. Stout, R. H. Clapp, U. V. Westover, G. W. Nelson, V. C. King, M. G. Werme, E. F. Early, R. R. Tatnall, R. C. Jordan and F. J. Connors.

WILLIAMS & CO. INC., Cleveland. Booth 243.—Demonstrating in actual welding various welding rods. In attendance: E. C. Edmundson, W. J. Lyons, N. J. Carbis, J. H. Penske Jr., K. J. Burkholder, B. F. Prentiss and H. M. Turner.

WILLSON PRODUCTS INC., Reading, Pa. Booth 251.—Exhibiting special glass, showing ability to stop harmful rays. In charge of F. H. Klein.

WILSON-MAEULEN CO. INC., New York. Booth 405.—Will show in operation indicating and recording pyrometers, temperature controllers, resistance thermometers and hardness testers. In charge of John P. Roberts, Harvey Lee, G. B. Duff, M. A. Schreiner, F. Walter and C. E. Hellenberg.

Z

ZIV STEEL & WIRE CO., Chicago. Booths 66, 87.

Drop Forging Institute To Hear Jeffries

The fall meeting of the American Drop Forging institute will be held Sept. 25-27 at Buckwood Inn, Shawnee-on-Delaware, Pa. The meeting will be addressed by Charles F. Abbott, executive director, American Institute of Steel Construction Inc., who will speak on "Rationalization of Production." Dr. Zay Jefferies, consultant, Aluminum Co. of America, Cleveland, also will speak, his subject, "Looking Toward the Future." Papers on various forging problems will be presented by members of the drop forging institute. Donald McKaig, 1001 Union Bank Building, Pittsburgh, is secretary of the institute.

Issues Safety Bulletin

National Safety council, 108 East Ohio street, Chicago, issued its safe practices pamphlet No. 35 on conveyors. The pamphlet deals with various types of conveyors and safety precautions that should be used during their operation. It is illustrated with halftone reproductions and drawings of safety appliances and various types of conveyors.

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

PLAINVILLE, CONN.—Trumbull Electric Mfg. Co., manufacturer of boards, blocks, etc., has plans for construction of a plant addition. Estimated cost about $40,000.

STAMFORD, CONN.—Pitney-Bowes Postage Meter Co., manufacturer of meter machines, has plans for the construction of a 2-story plant addition, 60 x 300 feet. Fletcher Thompson Inc., 542 Fairfield avenue, Bridgeport, Conn., is the architect. Estimated cost about $150,000.

WASHINGTON—District commissioners closed bids Aug. 22 for remodeling the power plant at the Gallinger hospital.

WASHINGTON—Department of commerce has been advised by George Wythe, commercial attache at Mexico City, Mexico, that an airplane plant is being constructed at Valbuena field, near Mexico City. The new company will build both military and naval planes, it was stated.

ATHOL, MASS.—Union Twist Drill Co., 70 Monroe street, awarded contract for a 2-story plant addition, 60 x 105 feet, to the E. J. Cross Co., 82 Foster street, Worcester, Mass. Estimated cost about $60,000.

BALTIMORE—Davis Iron Works Inc., 301 President street, contemplates building a plant addition. Probably this fall.

BALTIMORE—Curtiss Airports Inc., 27 West Fifty-seventh street, New York, has awarded contract to Stone & Webster Inc., 120 Broadway, New York, for hangars, shops, etc. Estimated cost of airport development $3,000,000.

BALTIMORE—Western Electric Co., 195 Broadway, New York, is having plans prepared for a 1-story boiler house here. The H. K. Ferguson Co., Hanna building, Cleveland, is engineer and will take bids about Sept. 1. Estimated cost $150,000.

SPARROWS POINT, MD.—Williamsport Wire Rope Co., Williamsport, Pa., has plans for the construction here of a 1-story plant, 100 x 180 feet.

LYNN, MASS.—Beacon Enameled Products Corp., recently incorporated to manufacture bathroom fixtures and kitchen utensils, advises it has leased a plant at 7 Willow street and will purchase welders, presses and enameling machines.

NEWARK, N. J.—American Transformer Co., 178 Emmet street, has awarded contract for a 2-story plant building to J. J. Thomas, 428 Peshine avenue. Estimated cost $30,000.

NEWARK, N. J.—Delaware, Lackawanna & Western railroad, Hoboken terminal, Hoboken, N. J., is receiving bids for two electric substations. One will be constructed here and the other at Denville, N. J. Estimated cost is about $40,000 each.

SEWAREN, N. J.—Public Service & Electric & Gas Co., subsidiary of the Public Service Corp. of New Jersey, Terminal building, Newark, N. J., has awarded contract for a power plant to the Service Production Co., 80 Park place, Newark.

BROOKLYN, N. Y.—Thomas Murcott, 298 Union avenue, manufacturer of files, is taking bids for a 1-story shop addition. Estimated cost about $30,000.

JAMESTOWN, N. Y.—Two-way Shock Absorber Co., Harrison street, manufacturer of shock absorbers, which recently installed machinery and equipment for increased production, is said to have plans for additional improvements within a few months.

JAMESTOWN, N. Y.—Pennsylvania railroad is reported ready to purchase the West Ridge Transportation Co., operating between here and Erie, Pa., and other points in this region. Construction of a new terminal, possibly including repair shops, here is planned if the purchase is completed. Approximately $1,000,000 is involved in the deal.

SYRACUSE, N. Y.—John Marsellus Casket Co. Inc. has awarded contract to the W. J. Burns Co., Keith building, for a 4-story plant addition. (Noted June 6.)

BRADFORD, PA.—Taylor Aircraft Corp., which recently moved here from Rochester, N. Y., will establish a plant at the municipal airport here for the manufacture of airplanes.

CLEARFIELD, PA.—Harbison-Walker Refractories Co. has started construction of a machine shop, 60 x 200 feet, at its property here.

ERIE, PA.—Erie Meter Systems Inc., manufacturer of gasoline measuring pumps, has acquired the former plant of the Consolidated Motor Truck Co., and is equipping it with machinery for capacity production.

WOONSOCKET, R. I.—United Street Railways Co., Main street, awarded contract for a 1-story garage and repair shop. Estimated cost about $60,000.

Resale News

ASSETS of the Viall Motor Car Co., Chicago, bankrupt, were sold at public auction Aug. 27 at 846 West 120th street. The property consisted of a large assortment of parts for trucks, machinery and fixtures. Samuel L. Winternitz & Co., Chicago, was in charge of the sale.

* * *

Industrial Plants Corp. will sell at auction Sept. 11, the plant of the Kiddies Metal Toy Co., South avenue and Berckman street, Plainfield, N. J. Equipment includes dies, tools, fixtures, lathes, shapers, milling machines, power presses, shears, seamers, lockers, rivets, hand tools, motors, tumbling barrels, trucks, raw materials and finished and semifinished toys.

Western States

ALAMEDA, CALIF.—Curtiss Airports Corp. Inc., 27 West Fifty-seventh street, New York, plans additional hangars and enlarging of airport here. Estimated cost about $1,000,000.

BERKELEY, CALIF.—Neilsen Steel Aricraft Co., Second and Camelia streets, has plans for the construction of a 2-story plant addition, 60 x 200 feet.

LOS ANGELES—Roam Aircraft Corp., which is completing its first airplane, has started construction of a manufacturing plant at the Los Angeles Metropolitan airport. L. C. Armstrong is president.

SAN FRANCISCO—Pacific Gas & Electric Co., 245 Market street, is having plans prepared for the construction of a meter plant and garage at Folsom and Eighteenth streets.

SAN FRANCISCO—Western Metal Products Co., 1160 Bryant street, has awarded construction contract for a 1-story plant addition. Estimated cost about $35,000.

HOOD RIVER, OREG.—City is having plans prepared for construction of a municipal power plant. Stevens & Koon, Portland, Oreg., are engineers. Estimated cost about $750,000.

West Central

MANCHESTER, IOWA—Aerolite Aircraft Co., Cedar Rapids, Iowa, is reported considering establishing a manufacturing plant here. Council has appointed committee to investigate the proposition.

LEROY, MINN.—Minnesota Fiber Co. will build a plant here for making flax fiber. It will be 40 x 60 x 140 feet, and will include a boiler plant.

KANSAS CITY, MO.—Research hospital, Twenty-third and Holmes streets, Charles Woodling business manager, has awarded contract for a laundry and boiler house to the Fleming & Gilchrist Construction Co., 1333 Wyandotte avenue.

SAVANNAH, MO.—City is having plans prepared for a municipal electric light plant. Burns & McDonnell, Interstate building, Kansas City, Mo., are engineers.

ST. LOUIS—Black Servant Mfg. Co., 2951 North Market street, has acquired a building containing about 10,000 square feet of floor space for the manufacture of coal stokers. Machinery and equipment will be required.

FALLS CITY, NEBR.—Kansas City Gas Service Co., 908 Grand avenue, Kansas City, Mo., plans construction of a gas plant to be built here. Estimated cost $35,000.

OMAHA, NEBR.—American Smelting & Refining Co., Ninth and Douglas streets, has started construction of a shop and office building here to cost about $25,000.

LAKOTA, N. D.—City is taking bids for the construction of a municipal electric light and power plant. Estimated cost about $30,000.

BERESFORD, S. D.—Norwegian Lutherans of America, John Johnson manager, is having plans prepared for a 2-story and basement boiler house for the old peoples home here. Sund & Dunham, Essex building, Minneapolis, are architects. Estimated cost $75,000.

East Central

BLOOMINGTON, ILL.—Hayes-Custer Stove Co., which recently completed a building program, contemplates a new expansion program which would substantially increase its production.

CHICAGO—Heuser Mfg. Co., 231 West Illinois street, manufacturer of screw machine products, has purchased a 2-story building on Paulina street. Possibly for expansion purposes.

CHICAGO—Thompson Aeronautical Corp., Union Trust building, Cleveland, contemplates construction of a 1-story hangar at Cicero and Sixty-third streets here. Estimated cost $200,000.

CHICAGO—Edison Electric Appliance Co., 5600 West Taylor street, has awarded construction contract to the J. E. Ericsson & Co., 123 West Madison avenue, for a 2-story plant addition. (Noted July 18.)

CHICAGO—Lapham Hickey Co., 3333 West Forty-seventh place, manufacturer and distributor of steel, has awarded contract for a warehouse addition, 148 x 177 feet, to the Poirot Construction Co., 38 South Dearborn street.

CHICAGO—A 4-story building at 161 North Jefferson street, occupied by several manufacturing concerns including the Guaranteed Plating Works and Iver Larsen, pattern and diemaker, was recently damaged by fire. Estimated loss $100,000.

CHICAGO—Temple Radio Corp., 1925 South Western avenue, manufacturer of radios, has purchased property at LaVergne avenue and West Sixty-fifth street, where it will build a plant containing about 300,000 square feet of floor space. Estimated cost about $500,000.

ROCHELLE, ILL.—George D. Whitcomb Co., manufacturer of electric, oil and gasoline locomotives, advises it has broken ground for the construction of a plant addition. Two cranes, one 50-ton capacity, will be installed in the new unit. The company will start another addition soon.

FORT WAYNE, IND.—Tokheim Oil Tank & Pump Co. advises it has awarded contract for a 1 and 2-story plant addition, which will provide about 30,000 square feet of additional floor space. (Noted Aug. 22.)

KNIGHTSTOWN, IND.—Indiana Soldiers and Sailors Orphans' home, care L. A. Cartner superintendent, will receive bids for a power house about Nov. 1. MvGuire & Shook, 941 North Meridian street, Indianopolis, are architects. (Noted April 18.)

BATTLE CREEK, MICH.—Consumers Power Co., Jackson, Mich., awarded a contract for a power house here to Stevens & Wood, Consumers building, Jackson. Estimated cost about $40,000.

BENTON HARBOR, MICH.—Covel Mfg. Co., manufacturer of sewing machines, advises it has awarded contract for an addition, 70 x 240 feet. A 40-foot 15-ton electric overhead traveling crane will be included. (Noted Aug. 22.)

DETROIT—Central Machine Co. has awarded construction contract for a plant to be built at 1050 Mt. Elliott avenue, to the Stibbard Construction Co., 3000 Grande River avenue. Estimated cost about $50,000.

DETROIT—Hoffman Construction Co., 7535 West Warren avenue, has been awarded contract for construction of two warehouses for the Peter Smith Stamping Co.

DETROIT—Hubbell, Hartgering & Roth, engineers, 2640 Buhl building, are preparing plans for a pumping station to be built at Central and Seventh avenues, Wyandotte, Mich., for the Wayne county road commissioners.

DETROIT—Wayne county, board of supervisors, Leroy C. Smith, chief engineer, 3800 Balum Tower, is having plans prepared for a 1-story power plant to be built at Goddard and Middlebelt roads. An airplane hangar estimated to cost about $350,000 is also included in the project. (Noted June 13.)

HIGHLAND PARK, MICH.—Highland Park Tool Co., 15 Victor avenue, contemplates construction of a 1-story plant addition estimated to cost about $30,000.

LANSING, MICH.—City, care O. E. Eckert, superintendent of the water & light department, awarded contract for a power plant addition to H. G. Christman, Porter apartments, Lansing. Estimated cost $750,000. (Noted June 20.)

CINCINNATI—Ohio Pattern Works & Foundry Co., 2730 Spring Grove avenue, awarded contract for a 1-story foundry addition to William Juergens & Son, 4434 Glenway avenue.

CLEVELAND—Bruce-Macbeth Engine Co., 2111 Center street, manufacturer of gas engines, contemplates building a plant addition.

CLEVELAND—Tool Die Products Co., formerly at 2091 East Nineteenth street, has leased about 5000 square feet of floor space in a building at East Forty-ninth street and Luther avenue. Machinery will be installed.

DAYTON, O.—Stanley Mfg. Co., manufacturer of metal letters, has leased two floors in the building at Meigs and Monument streets from the Fogarty Mfg. Co.

DAYTON, O.—Fogarty Mfg. Co., 800 East Monument street, manufacturer of name plates, etc., has leased the 5-story building of the old Day Fan Co.'s plant at Meigs and Monument streets, presumably for expansion.

DAYTON, O.—Roy Wirshing and Harvey Huffman, of the Elite Machine Co., manufacturer of arc lamps, machines, etc., has leased about 5000 square feet in the Norwood Power building, at Fifth and Norwood streets, for manufacturing purposes.

MILWAUKEE—Two plant buildings of the Wisconsin Malleable Iron Co., 94 South Bay street, were recently damaged by fire.

MILWAUKEE—Outboard Motors Corp., Twenty-seventh street and Capitol drive, awarded contract for a 1 and 2-story plant and office building to the Klug & Smith Co., 69 East Wisconsin avenue. Estimated cost $75,000.

WEST BEND, WIS.—Pick Mfg. Co., manu-

facturer of automobile replacement parts, which recently purchased an 8-acre tract, has started construction of a 1-story plant, 50 x 300 feet.

Southern States

SOUTH JACKSONVILLE, FLA.—City opens bids Aug. 27 for a municipal power plant to be built at 335 South Hendricks avenue. Estimated cost about $27,000.

TAMPA, FLA.—Prest-O-Lite Co. Inc., 30 East Forty-second street, New York, awarded contract for a 1 and 2-story acetylene plant here to the Frost Construction Co., Marion and Twigg streets. (Noted Aug. 15.)

MONROE, LA.—Twin City Motor Co., 1909 St. John street, has acquired site at Grand and Mulberry streets, for the construction of a sales agency, including repair shops. The building will contain about 20,000 square feet of floor space.

NEW ORLEANS—Charity hospital has plans for improvements, including a boiler plant addition to cost about $110,000.

NEW ORLEANS—Flintkote Co. has started construction of a power house addition to its plant here estimated to cost about $100,000. General offices are at 31 St. James avenue, Boston.

NEW ORLEANS—Big Chief Oil Refining Co. of New York, which recently purchased a 100-acre tract at Cedar Grove plantation, for the building of a refinery is having the preliminary work done by the Graham Engineering Co., Godchaux building, New Orleans. Estimated cost $2,000,000.

BRACKETTVILLE, TEX.—City plans to vote Sept. 3 on $60,000 bond issue for waterworks improvements, including pumping equipment.

FREDERICKSBURG, VA.—A boiler house will be included in the group of buildings to be built here by the Sylvania Industrial Corp., 122 East Forty-second street, New York. Construction will be started at once. (Noted Aug. 22)

Recent Incorporations

BELLEVILLE, ILL.—Bell Foundry & Casting Co., 1400 North Illinois street, has been incorporated with $1000 capital to engage in a general foundry business, by E. A. Schicktanz.

CHICAGO—Aluminum Industries Inc., 1827 South Michigan avenue, has been incorporated with $10,000 capital to manufacture metals and by-products, by Leonard Garver Jr.

CHICAGO—Crampton Cabinet & Fixture Co., 6900 Cottage Grove avenue, has been incorporated with 350 shares of no par stock to manufacture and sell store and office fixtures, by August Walters Jr.

CHICAGO—Chicago Building & Construction Co., room 1209, 111 West Washington street, has been incorporated with 1000 shares of no par stock to engage in a general contracting and construction business, by Jacob J. Chapman.

BOSTON—Automatic Candy Corp. has been incorporated with $100,000 capital to manufacture and lease vending machines. Louis P. Rabinovitz, 20 Fenelon street, Dorchester, Mass., is one of the incorporators.

BOSTON—Harvest Milling Co. Inc. has been incorporated with $25,000 capital to manufacture and deal in apparatus, machinery and containers for the milling business. Raymond D. Alderman, 191 Forest street, Winchester, Mass., is president.

BRIGHTON, MASS.—Somers Oil Burner Corp., 2 Brook street, has been incorporated with 5000 shares of no par stock to manufacture heating devices. Charles A. Benford, 230 Walnut street, Newton, Mass., is president.

BOSTON—New England Sign Advertising Co. Inc., 79 Sudbury street, has been incorporated with 1000 shares of no par stock to manufacture and deal in store fixtures and electric signs. Ulysses J. Silva, 5 Bayside street, Dorchester, Mass., is president and treasurer.

LYNN, MASS.—Beacon Enameled Products Corp. has been incorporated with $100,000 capital to manufacture and deal in enameled, steel wire and other products. Aaron Kobrin, 15 Kings Beach terrace, Swampscott, Mass., is president.

PEABODY, MASS.—A. Mogavero Inc. has been incorporated with $35,000 capital to engage in the construction and contracting business. Charles A. Mogavero, Peabody, is president.

WALTHAM, MASS.—Rhodes Mfg. Co. has been incorporated with 5000 shares of no par stock to manufacture and sell tools, parts and machines. Warren Ames, Waltham, is president.

WHITMAN, MASS.—Higgins MacRoberts Co. Inc., 31 South avenue, has been incorporated with $10,000 capital to manufacture electrical appliances, etc. Byron M. Higgins, 105 Fullerton avenue, Whitman, is president.

BAY CITY, MICH.—Safety Signal Co., 302 Davidson building, has been incorporated with $25,000 capital to manufacture and sell a signal for automobiles, by Russell A. Post.

DETROIT—Modern Collet & Machine Co., 391 Salliotte street, Ecorse, has been incorporated with $50,000 capital to engage in a general manufacturing business, by Irving H. Sheffer.

DETROIT—Bradley Construction Co., Fox Theatre building, has been incorporated with $10,000 capital to engage in the construction business, by F. X. Bradley.

DETROIT—Peerless Stamping Co., 3570 Mitchell avenue, has been incorporated with $50,000 capital to manufacture and deal in metal containers, cans, etc., by Leo Schinagel.

DETROIT—Airport Lighting Inc. has been incorporated with 100,000 shares of nor par stock to manufacture and install a night lighting system for airports. Harold H. Emmons, chairman of the Detroit Aircraft Corp., is a director.

FLINT, MICH.—A. G. Redmond Co., 1109 Stewart avenue, has been incorporated with $50,000 capital to manufacture and sell automotive products, by Albert G. Redmond.

GRAND RAPIDS, MICH.—Miller Mfg. Co., 17 Lyon street northeast, has been incorporated with 5000 shares of no par stock to manufacture and deal in machinery and equipment, by Joseph Stevens Jr.

SAGINAW, MICH.—Saginaw Foundries Co., 930 Water street, has been incorporated with $200,000 capital to operate a foundry, by Fred W. Stork.

RIDGEFIELD PARK, N. J.—Grace Construction Corp. has been incorporated with $50,000 capital to engage in the construction business, by Morrison, Lloyd & Morrison, 173 Main street, Hackensack, N. J.

CAMDEN, N. J.—Delaware Atlantic Aero Corp. has been incorporated with 2500 shares of common stock to manufacture airships, by the New Jersey Corp. Guaranty & Trust Co., 304 Market street, Camden.

FIELDSBORO, N. J.—Mackenite Metal Corp. has been incorporated with 1000 shares of common stock to manufacture metal castings, by Romulus P. Rimo, American Mechanic building, Trenton, N. J.

NEWARK, N. J.—Schmitt Sheet Metal Corp. has been incorporated with 2500 shares of common stock, by Nathan H. Berger, 776 Broad street, Newark.

RIDGEFIELD PARK, N. J.—Excelo Construction Corp. has been incorporated with $50,000 capital to engage in the construction business, by Morrison, Lloyd & Morrison, 173 Main street, Hackensack, N. J.

UNION CITY, N. J.—American Shoe Polishing Machine Corp. has been incorporated with $50,000 of preferred and 200 shares of common stock, by Pierson, Schroeder & Brand, 84 Washington street, Hoboken, N. J.

BROOKLYN, N. Y.—United States Tube & Bending Co. has been incorporated with $10,000 capital, by L. W. Beilin, 1440 Broadway,

New York.

BUFFALO—General Specialty Co. has been incorporated with $50,000 capital to operate a machine shop, by Bartholomew & Bartholomew, Prudential building, Buffalo.

NEW YORK—Industrial Pattern & Foundry has been incorporated with $2100 capital, by H. T. Weeks, 18-30 Astoria avenue, Long Island City, N. Y.

NEW YORK—Shelton Cab Mfg. Corp. has been incorporated with $20,000 capital, by J. I. Alexander, 123 William street.

MIAMI, OKLA.—Eleventh Hour Mining Co. has been incorporated with $50,000 capital, by Clyde Morsey, Miami, H. O. Neff and R. W. Cole, Joplin, Mo.

OKLAHOMA CITY, OKLA.—Standard Steel Form Co. has been incorporated with $50,000 capital, by Henry M. Schutt, El Reno, Okla.

EMIGSVILLE, PA.—Atlas Mfg. Corp. has been incorporated with $10,000 capital to manufacture and deal in all kinds of metals and metal products. Alwin A. Schulz, York, Pa., is treasurer.

VANCOUVER, B. C.—Electric Lamp Reclamation Service Ltd. has been incorporated to reclaim and utilize electric lamps, with $50,000 capital by Herman Gildemester, Harry Kirk and Frederick S. Smith, all of Vancouver.

HAMILTON, ONT.—Union Wire Die Co. Ltd. has been incorporated to manufacture and deal in dies for drawing and extruding wire, material for manufacturing dies and machine tools, with $40,000 capital, by James W. Kerr, Frances E. Drops and George C. Thomson, all of Hamilton.

KINGSTON, ONT.—Janney Aircraft & Boats Ltd. has been incorporated to manufacture and deal in airplanes, marine engines, radio and radio equipment with a capital of $200,000 and 200,000 shares of no par stock, by William K. Murphy, Hugh H. Donald and Earnest L. Claridge, all of Toronto.

OSHAWA, ONT.—Ontario Electrical Construction Co. Ltd. has been incorporated to manufacture and install electric equipment with $40,000 capital by Charlie Bowra, Gordon Houlden and Robert E. Hawke, all of Oshawa.

SAULT STE. MARIE, ONT.—Superior Alloys Ltd. has been incorporated to manufacture and deal in metal products with a capital of $100,000 and 2000 shares of no par stock, by John A. McPhail, Albert E. Pickering and Robert A. Campbell, all of Sault Ste. Marie.

TORONTO, ONT.—Donald F. Johnson Ltd. has been incorporated to manufacture and deal in automobile accessories, radios and radio equipment, with $100,000 capital, by Donald F. Johnson, James Cohen and Robert I. Ferguson, all of Toronto.

WALKERVILLE, ONT.—Bolton Electric Co. Ltd. has been incorporated to carry on the business of electrician, mechanical engineer, manufacturer of engines, dynamos and generators, with a capital stock of $30,000 and 10,000 shares of no par stock. Provisional directors are Frederick F. Bolton, Eric Bolton of Walkerville, and George H. Price of Windsor, Ont.

MONTREAL, QUE..—Continental Aero Corp. Ltd. has been incorporated to manufacture and deal in electrical and mechanical machinery and devices with a capital of $50,000 and 40,000 shares of no par stock by Walter S. Johnson, Gerald M. Almond and Kathleen Gale, all of Montreal.

REGINA, SASK.—Home Electric Co. Ltd. has been incorporated to carry on the business as electrician, mechanical engineer, manufacturer of engines and electrical appliances, with $75,000 capital by Abraham P. Brandt, Gustav D. Pelzer and Adolph J. Milner, all of Regina.

New Trade Publications

ELECTRIC METERS—Sangamo Electric Co., Springfield, Ill., has issued a bulletin on its alternating current switchboard meter, with illustrations and descriptions of details, operations and testing.

GRAPHIC RECORDERS—Study of costs by means of graphic instruments is outlined in a bulletin issued by the Esterline-Angus Co., Indianapolis. Charts are shown and an illustrative study of application of the record of a machine to cost determination is given.

PUNCH AND SHEAR—A quadruple combined universal punch and shear with built-in notcher, is the subject of a bulletin of Henry Pels & Co. Inc., 90 West street, New York. The machine is described, specifications given and illustrations shown, with details.

WELDING APPARATUS—Harris Calorific Co., Cleveland, describes its gas welding accessories in a current catalog. The apparatus described includes generators, torches, regulators, hose fittings, manifolds, needle valves, etc. The bulletin is well illustrated.

BOILER FEED CONTROL—Northern Equipment Co., Erie, Pa., has prepared a catalog of the Copes system of boiler feed control, giving complete description of low and high pressure service, with photographs of actual installations. Several devices not heretofore cataloged are included.

CONTROLLERS—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has issued a 4-page folder on its 2 to 100-horsepower, 115 to 550 volt, direct current, drum controllers. Application, distinctive features, operation and construction of the apparatus are illustrated and described.

GEAR BURNISHER—City Machine & Tool Works, Dayton, O., has issued a bulletin on its new type of gear burnisher for gears from 1¼ to 8 inches in diameter and up to 11½ inches long. Illustrations show application of burnisher to gears held in a vertical position, preventing sag and distortion.

ELECTRIC LOCOMOTIVES—Baldwin Locomotive Works, Philadelphia, and the Westinghouse Electric & Mfg .Co., East Pittsburgh, Pa., have published jointly a 24-page bulletin on mine and industrial locomotives. Performance, weight, electrical and mechanical equipment and dimensions are given, with a blueprint and illustration of each locomotive.

GRINDING MACHINES—Norton Co., Worcester, Mass., has published two folders on its swing-frame grinding machines. The first describes 16-inch and the second the 24-inch machine for high speed snagging. The bulletins are illustrated with views of the machines assembled and disassembled and contain a list of the features and specifications.

INDUSTRIAL LOCOMOTIVES—Locomotives with internal combustion engine drive are the subject of a booklet prepared by the George D. Whitcomb Co., Rochelle, Ill. It presents advantages, uses and economies effected by using locomotives powered with internal combustion engines. Facts are presented on representative savings obtained.

WELDING—Linde Air Products Co., New York, is circulating a bulletin on the welding of aluminum and its alloys. It contains a discussion of the current practices in welding commercial grades of aluminum and describes the technique necessary on various types of jobs. The bulletin is well illustrated with views of different type jobs.

MOTORS—General Electric Co., Schenectady, N. Y., has published two folders, one dealing with direct current, constant or adjustable speed, shunt or compound wound motors with manual or magnetic control. The other supplies information on its totally enclosed, fan-cooled, continuous duty, two and three phase squirrel-cage motors of 1½ to 15-horsepower, 60 cycles, 220, 440 and 550 volts.

SEAMLESS STEEL TUBES—Globe Steel Tubes Co., Milwaukee, has published a booklet on its tube plant. It is a story in pictures of the production of seamless tubes from solid billets, taking the reader on a sightseeing trip through the plant, showing the succeeding operations in production and testing of the tubes. A chart of various shapes shows how tubes are formed for various automotive uses.

CIRCUIT BREAKERS—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., illustrates in a current bulletin two types of oil circuit breakers for medium interrupting capacity use. They are supplied in various sizes and rating to suit needs. Tables show closing and tripping currents for solenoid and motor mechanism, interrupting capacities, shipping weights, mounting details and various accessories and attachments. Dimension drawings are shown.

DRILLS—Aurora Tool Works, Cincinnati, division of the Oesterlein Machine Co., in its current catalog, illustrates details of its drills and gives complete specifications on all sizes from 20 to 44 inches. It shows the new multiple drillhead which may be used with all sizes of drills. Illustrations are given of how these drills may be adapted to special uses, as, boring and facing machines, lapping machines, honing machines, highspeed and special drills.

ACCIDENTS—Metropolitan Life Insurance Co., New York, recently has issued a bulletin on the prevention of foundry accidents. It outline points necessary for the success of a foundry safety program and gives charts that may be used to determine the efficiency of the campaign. The second section is devoted to foundry safety methods. It also contains a chart which analyzes the cause of accidents as obtained from 208 foundries. A list is given of the companies that co-operated in supplying information for the report.

QUALITY

Whenever mills must roll stock to rigid gauge specifications the roll neck bearings have a great influence on gauge size and production costs.

With Timken Bearings on the roll necks the percentage of rejects is radically lowered. The rolls are held permanently and closely to setting, and the gauge of the finished stock is inevitably uniform.

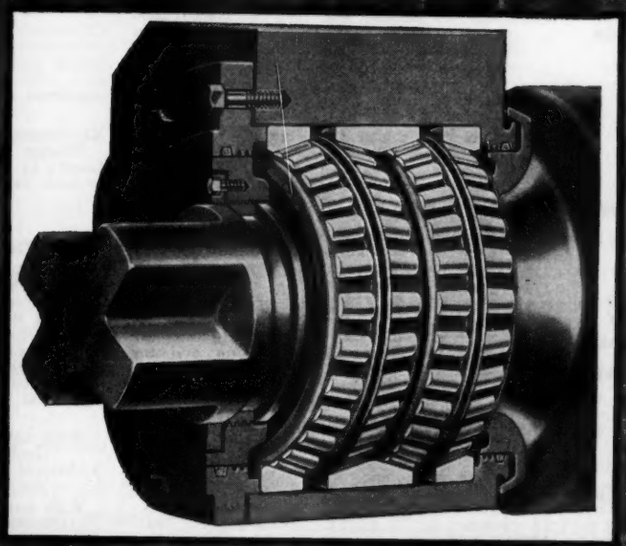
In the case of new mills these economies are obtained without extra investment, for the initial saving made possible by smaller gear and motor sizes often more than compensates for the initial cost of the bearings.

And in getting an old mill on a Timken-equipped basis Timken Bearings on roll necks often pay for themselves in a few months *in power savings alone*—while eliminating excessive maintenance costs, delays from bearing failures and expensive lubrication.

These benefits are all made permanent by Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken steel.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *Tapered Roller* **BEARINGS**



Pipe and Tube Prices—Plate Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

To large jobbers these discounts are increased by 1 point and two supplementary discounts of 5 per cent on black, and 1½ points and two supplementary discounts of 5 per cent on galvanized.

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

	Black.	Galv.
¼ and ⅜-inch	+11	+36
½-inch	23	5
¾-inch	28	11
1 and 1¼-inch	31	15
1½ and 2-inch	35	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	9
2½ to 3½-inch	28	12
4 to 6-inch	30	17
7 and 8-inch	29	16
9 to 12-inch	26	11

REAMED AND DRIFTED

2-inch to 6-inch—Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+13	+48
½-inch	23	7
¾-inch	28	12
1 to 2-inch	34	18

Lap Weld

2-inch	29	13
2½ to 4-inch	34	20
4½ to 6-inch	33	19
7 and 8-inch	31	17
9 to 12-inch	21	8

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

Jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized wrought iron pipe.

On extra or double extra strong pipe fitted with threads and couplings basing discount lowered 5 points from plain end price. Fitted with threads only, basing discount lowered 3 points for random lengths.

Boiler Tubes

Pittsburgh carload discounts

STEEL (Lap Weld)

2 and 2¼-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3¼ to 3¾-inch	56 off
4-inch	59 off
4½ to 6-inch	48 off

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. Over 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

CHARCOAL IRON

1½-inch	1 off
1¾-inch	8 off
2 and 2¼-inch	13 off
2½ and 2¾-inch	16 off
3-inch	17 off
3¾ to 3½-inch	18 off
4-inch	20 off
4½-inch	21 off

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discount reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

SEAMLESS COLD DRAWN

1-inch	63 off
1¼ and 1½-inch	55 off
1¾-inch	39 off
2 and 2¼-inch	34 off
2½ and 2¾-inch	42 off
3-inch	48 off
3¼ and 3½-inch	50 off
4-inch	53 off
4½, 5 and 6-inch	42 off

SEAMLESS HOT ROLLED

1¾-inch	39 off
2 and 2¼-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3¼ and 3½-inch	56 off
4-inch	59 off
4½, 5 and 6-inch	48 off

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for lengths over 24 feet.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weight.

Over 100 to and including 110 inches	.05c
Over 110 to and including 115 inches	.10c
Over 115 to and including 120 inches	.15c
Over 120 to and including 125 inches	.25c
Over 125 to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 to and including 84 inches	.10c
Over 84 to and including 96 inches	.20c
Over 96 to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{16}$-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot..... .20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{16}$-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds square foot.... .20c

Plates ordered 7.65 pounds square foot .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, classes A-B	1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c